EXHIBIT A

REDACTED

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

TEVRA BRANDS, LLC, Plaintiff, v. **BAYER HEALTHCARE LLC, and BAYER ANIMAL HEALTH GmbH, and BAYER AG,** Defendants.	Case No. 3:19-cv-04312-BLF

REBUTTAL REPORT OF DR. PAUL WONG

28 September 2023

HIGHLY CONFIDENTIAL – ATTORNEYS' EYES ONLY

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List of Exhibits

Exhibit 10A:	Tevra's Lost Profits, Based on Frontline's Sales History and Bayer's Wholesale Customers with Exclusive Contracts, 2017-2023 (Est.)
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I. Introduction

A. Qualifications

1. My qualifications and experience are summarized in my initial report.[1] Since the filing of that report, my CV has not changed. That said, it is re-attached as **Exhibit 1**.

B. Assignment

2. Counsel for Plaintiff, Tevra Brands ("Tevra"), has asked me to review the reports of Dr. Celeste C. Saravia[2] and Mr. Andrew D. Richmond[3] and respond as may be appropriate and warranted from an economic perspective.

3. As before, because expert discovery is ongoing, I may supplement or refine my opinions as warranted by any relevant new information, new allegations by Plaintiff, and analyses or opinions by Defendants' expert(s). While my opinions are preliminary in that sense, they are based on the extensive information and data I have already reviewed and analyzed, so I do not expect these opinions to change materially.

4. NERA's compensation for my time is currently $810 per hour. Similarly, NERA's compensation for my staff's time is at standard hourly rates. No payments to NERA are contingent upon the outcome of this case or upon the nature of my opinions.

C. Materials Relied Upon

5. As before, the opinions in this report are based on my professional training and experience, as well as on my review of Tevra's complaint in this matter, data and documents produced in the course of discovery, and information from publicly available sources. A complete list of the materials and information that I relied upon to prepare this report is attached as **Exhibit 2**. Many of the footnotes in this report also cite to these materials.

II. Summary of Opinions

6. In this report, I respond to claims made by Bayer's economics and damages experts, Dr. Saravia and Mr. Richmond, respectively. Both of their reports are rife with

[1] Expert Report of Dr. Paul Wong, August 9, 2023 ("Wong Report").

[2] Expert Report of Dr. Celeste C. Saravia, September 7, 2023 ("Saravia Report").

[3] Expert Report of Mr. Andrew D. Richmond, September 7, 2023 ("Richmond Report").

speculation, bare assertions, and unsound analysis (or often no analysis or evidentiary support at all). They both frequently mischaracterize my extensive quantitative analyses and the data and record evidence that I rely on. After a review of their reports, I re-affirm the opinions outlined in my initial report—other than small clarifications discussed in the sections of this report that follow, the results of my analyses and the opinions derived from them are unchanged.

7. As I detail below, neither of Bayer's experts provide a refutation of these key facts:

- **Fact 1:** Bayer instituted a small but significant non-transitory price increase ("SSNIP") from 2011 to 2016 (*see* **Section III**).
- **Fact 2:** Bayer and, thus, all imidacloprid spot-on products saw no meaningful substitution away and toward any other products, including Frontline, generic fipronil products, Seresto, and oral treatments, from 2011 to 2016—this occurred despite Bayer's SSNIP and despite significantly increasing competition from generic fipronil products, Seresto, and oral treatments (*see* **Section IV**).
- **Fact 3:** In comparison to Bayer, Frontline saw drastic, significant substitution away and toward other products, namely generic fipronil products and other flea and tick treatments—Frontline lost nearly 60% of its sales from 2010 to 2016 (*see* **Section IV**).
- **Fact 4:** After 2016, once generic imidacloprid products entered in competition with Bayer, its sales fell only about 25% despite attempts from these generic imidacloprid products to compete aggressively—in comparison, Frontline lost nearly 50% over a comparable period in which its own generic fipronil competitors entered (*see* **Section IV**).

These facts are supported with extensive economic theory, quantitative analysis using multiple different methods, and real-world data.

8. Based on the above facts, it is my opinion that one can draw the following four main conclusions:

- **Conclusion 1:** The relevant antitrust market for this case is limited to only imidacloprid spot-on products and excludes all other flea and tick products (*see* **Section VI**)—**Facts 1, 2, and 3** above prove that Bayer's own history satisfies the hypothetical monopolist test ("HMT"), since it instituted a profitable SSNIP and there was not sufficient substitution to other products to defeat the SSNIP.

- **Conclusion 2:** Bayer held and exercised monopoly power from 2011 to 2016 (*see* **Section VII**)— **Facts 1, 2, and 3** also prove that Bayer's own history shows (i) high sustained market shares and significant barriers to entry for the relevant market of imidacloprid spot-on products and (ii) direct evidence of supracompetitive prices (namely, an ability to raise prices without losing significant sales).
- **Conclusion 3:** Bayer's conduct after 2016 significantly foreclosed competition by blocking generic competitors' access to distribution channels needed to compete for tens of millions of doses and hundreds of millions of dollars of sales per year (*see* **Section VIII**)—**Fact 3** shows what effect free and clear competition has on a branded flea and tick product, but **Fact 4** shows that Bayer was not subject to the same effects and, instead, benefited from a restraint on competition.
- **Conclusion 4:** Bayer's actual sales trend can be compared to the historical sales trend for Frontline, and the difference between the two trends estimates the harm imposed on generic competitors by Bayer's anticompetitive conduct (*see* **Section IX**)—**Fact 4** can, thus, be utilized to calculate a reasonable estimate of damages to Tevra.

These conclusions were all presented in my initial report, and they rely on real-world facts that Bayer's experts do not (and cannot) refute.

9. Bayer's economic expert, Dr. Saravia, dedicates most of her report to mischaracterizing my analyses and disagreeing the above four conclusions despite the evidence standing overwhelmingly against her. As I discuss in detail:

a) She does not actually refute the above main facts (*see* **Sections III and IV**)—rather, she focuses on (wrongly) disputing my regression analysis (*see* **Section V**) which is but one of multiple methods I employ. Her methodologic criticisms are meritless and contrary to the economic literature (even literature she herself cites), and she ignores how each of the facts I present is shown with multiple methods beyond strictly a regression analysis.

b) She does not dispute the facts that support a relevant market of only imidacloprid spot-ons—rather, she disputes whether they constitute a proper HMT and, instead of addressing the key real-world facts, focuses her attention on both economic theory and business documents that are inapt and unreliable (*see* **Section VI**).

c) She ignores the persistence of Bayer's market share and clear barriers to entry for the relevant market of imidacloprid spot-ons, and she ignores the direct evidence that Bayer exercised monopoly power by raising its prices before 2016 (*see* **Section VII**).

d) She focuses on the wrong theory of foreclosure, miscalculates the share and significance of foreclosure, and proposes flawed, wholly speculative claims that Bayer's conduct was "procompetitive" because it promoted advertising (*see* **Section VIII**).

In this report, I provide a thorough refutation of Dr. Saravia's claims, explaining how none of her extensive speculation and bare assertions undermine my analysis and core opinions.

10. Bayer's damages expert, Mr. Richmond, similarly dedicates most of his report to mischaracterizing my analyses and ignoring the sound basis in economics and the record evidence for my damages estimates. He incorrectly and unconvincingly attempts to refute my analysis of Frontline's history, and he proposes a flawed, unreasonable, implausible alternative damages estimate (*see* **Section IX**).

III. The Facts Concerning Bayer's Prices Over Time for Advantage/Advantix

11. Real-world data in this case show that Bayer significantly raised its prices for Advantage/Advantix from 2011 to 2016. This is an important economic fact, as it (a) shows Bayer held and exercised monopoly power up to 2016, and (b) shows that the relevant market is appropriately defined as being limited to only imidacloprid spot-ons—competition from all other products, including Frontline and generic fipronil spot-ons, was not enough to constrain and render unprofitable Bayer's price increase.

12. Bayer's economics expert, Dr. Saravia, does not dispute the fact that Bayer raised its prices. She only disputes the magnitude and significance of the price increase. Further, her dispute is confined to selectively focusing on some (but not all) measures of the significance of Bayer's price increase and proposing definitions of significance that are not consistent with well-accepted economics. In short, her criticism (a) does not actually deny the key fact that Bayer instituted a price increase, and (b) relies on a results-oriented approach that is not in line with sound economic analyses or principles.

A. Dr. Saravia Agrees that Bayer Raised Its Prices

13. [redacted]

14. As I explained in my initial report, the data show that Bayer implemented a price increase for its Advantage/Advantix products according to numerous measures. **Exhibit 3B** of this report summarizes those multiple different measures:

[4] Saravia Report, n. 334.

[5] The revised estimates, as I had intended initially, take the average retail prices for generic imidacloprid and generic fipronil and deflate those retail prices by the average wholesale markup to compute the estimated wholesale price (i.e., retail price *is* by definition the wholesale price multiplied by a markup, so by going in reverse, one can recover the wholesale price based on the retail price and markup). Dr. Saravia uses unnecessarily dramatic language to call this standard estimate "unfounded and biase[d]" without herself offering any basis for this characterization (Saravia Report, n. 334). She speculates without evidence that generic products may have experienced a different percentage markup. She does not show that this would matter significantly or change any of the conclusions one would draw. As I show in my initial report, the estimated wholesale prices (based on deflating retail prices) are consistent with a host of cross-validations of the data that I conduct (*see*, generally Wong Report, **Appendix I** and **Exhibits 4A-4E**, **A1-A4**).

[6] To be clear, this means that my initial analysis was simply overly conservative in Bayer's favor. Based on the prior calculations, despite being overly conservative, I showed that Bayer raised prices significantly. I now simply re-confirm with updated calculations that Bayer raised prices significantly.

[redacted]

15. Dr. Saravia does not dispute the fact that Bayer did, in fact, raise it prices over that period. Rather, she simply tries to distract from the significance of the facts by obfuscating plain numbers and a straightforward presentation of record evidence. Overall, her critiques do not actually disprove the fact that Bayer increased its prices significantly, and for multiple of the

measures of Bayer's price increase presented above, she is simply silent, providing no basis to dispute the numbers. I address each of her critiques regarding prices below.

16. First, Dr. Saravia disputes Bayer's net prices that I estimated for 2011 and 2012.[7] She does not dispute the fact that the data produced by Bayer are incomplete and clearly incorrect (without adjustment for Bayer's omission), and thus estimates are needed for these years. As I explained in my initial report, Bayer produced data showing its gross prices, but Bayer failed to produce any corresponding data on discounts or rebates in these years.[8] To address the omitted data that Bayer was unable or unwilling to produce, I estimated the omitted discounts based on (a) continuously and consistently measured prices of Bayer products sold at retail by Petco from 2010 to 2020, and (b) continuously and consistently measured prices of those same Bayer products sold at wholesale to Petco from 2014-2020.[9] The difference between the two continuously and consistently measured time series can be used to estimate the omitted data.

17. [redacted]

[7] Saravia Report, ¶ 108.

[8] Wong Report, ¶¶ 143-144. *See also* Saravia Report, ¶ 105 (agreeing that the all-zero-discount data is erroneous since she states that "no customer paid gross prices").

[9] *Id.*

[10] Saravia Report, ¶ 108.

[redacted]

[11] If one were to insist on using the potentially flawed 2013 data, it would be more reasonable to use the overall average from 2013 to 2020. But that average including 2013 is not significantly different from the 2014 to 2020 average that I used in my initial calculations.

[12] Dr. Saravia states she "set[s] aside" analysis of gross prices because "no customer paid gross prices." *See* Saravia Report, ¶ 105. Even if no customer paid gross prices, the change in these prices over time is informative as to whether Bayer increased its prices. As an example, the Frontline data (which is undisputed) show Frontline increased its gross and net prices in a similar manner each year. Like this example, Bayer's increase in gross price is consistent with and indicative of its overall efforts to increase prices.

f) Relative to the average price of all fipronil spot-ons ($8.08 per dose in 2011 to $6.67 in 2016), her own numbers suggest that Bayer changed from a 3% discount as of 2011 to a 21% premium as of 2016 (+24 percentage points in relative prices).

Thus, even using her own numbers, there are at least six measures by which Bayer increased its prices significantly. Moreover, multiple of these measures are not even addressed by Dr. Saravia.

19. Second, Dr. Saravia asserts that an analysis of Bayer's prices should more appropriately look at the 2013-2016 timeframe.[13] She claims that—by ignoring 2011 and 2012—Bayer did not raise its prices.[14] This line of logic lays bare Dr. Saravia's results-oriented approach—simply ignoring data inconvenient to one's desired result is not a reliable or sound economic analysis. There is no basis to arbitrarily select a shorter timeframe. Doing so goes against the very question at hand—we want to test whether a *sustained* price increase has occurred historically, thus shortening the timeframe for this analysis is facially self-defeating for the question at hand. Further, there is no limiting principle to her approach—with real-world data, which inevitably fluctuate to some degree year-over-year, one can always find some arbitrary window that suits any desired result. My analysis looks at a six-year window—rather than some arbitrarily chosen and shorter window—and show that Bayer sustained a significant price increase over that full period.

20. Moreover, any shorter window of time does not refute a number of the different measures showing Bayer's price increase. Whether net prices declined in a short window of time year-over-year does not change the undisputed fact that Bayer's gross prices increased over the full period from 2011 to 2016. It also does not change the facts that Bayer's prices were suddenly at a significant premium relative to fipronil generics once those generics were introduced, and that the gap in prices between Advantage/Advantix and the average fipronil spot-on grew over time due to increasing sales by those generics. And it does not change the fact that Bayer further increased its prices after 2016 by significant magnitudes, both in absolute and relative terms. In short, one cannot deny the longer-run facts that all consistently show that Bayer did, indeed, implement significant price increases to its Advantage/Advantix products over a sustained period.

[13] Saravia Report, ¶ 111.

[14] *Id.*

B. Dr. Saravia's Characterization of the Magnitude and Significance of Bayer's Price Increase is Contrary to Well-Accepted Economics

21. Rather than disputing the fact that Bayer increased its prices from 2011 to 2016, Dr. Saravia instead attempts to minimize the significance of the price increase. Her efforts to do so are arbitrary, invented out of whole cloth at times, making little common sense, and *not* supported by any reliable economics. The simple fact is that Bayer raised its prices by a significant non-transitory amount by multiple measures. That price increase—which constitutes a small but significant non-transitory increase in price ("SSNIP") under well-accepted economic definitions—shows that (a) the hypothetical monopolist test is satisfied, and (b) Bayer held and exercised monopoly power.

22. To be clear, the economic literature and well-known principles establish that a SSNIP is case-specific. A 5% threshold is a commonly used benchmark, but a price increase less than that (e.g., 3%) can be a SSNIP. The frequently cited *Horizontal Merger Guidelines* ("HMG") explain this principle clearly and explicitly:

> The Agencies most often use a SSNIP of five percent of the price paid by customers for the products or services to which the merging firms contribute value. However, **what constitutes a "small but significant" increase in price, commensurate with a significant loss of competition caused by the merger, depends upon the nature of the industry and the merging firms' positions in it, and the Agencies may accordingly use a price increase that is larger or smaller than five percent.** Where explicit or implicit prices for the firms' specific contribution to value can be identified with reasonable clarity, the Agencies may base the SSNIP on those prices.[15]

23. In this case, it is perfectly reasonable and within standard economic practices to conclude that Bayer instituted a SSNIP, even by the lowest numbers that Dr. Saravia herself proposes. As a prime example, she herself estimates that Bayer raised its net prices for Advantage/Advantix by 2.8% from 2011 to 2016—it is reasonable to consider that increase as a SSNIP in light of the falling prices for numerous other products in the same industry. As noted above, the 2.8% increase by her numbers stands in stark contrast to the 17.5% price decline for

[15] "Horizontal Merger Guidelines," United States Department of Justice and The Federal Trade Commission, August 19, 2010, https://www.justice.gov/atr/horizontal-merger-guidelines-08192010 (accessed 9/27/2023) ("Horizontal Merger Guidelines"), § 4.1.2 (emphasis added).

the average fipronil spot-on over the same period,[16] the introduction of generic imidacloprid spot-ons in 2016 price at an average 39% discount relative to Advantage/Advantix,[17] and the introduction of other flea and tick treatments also priced on average at a significant discount relative to Advantage/Advantix (e.g., Seresto at a "46% to 53% discount").[18] Even if Bayer's price increased less relative to itself, it does not change the fact that (a) it did increase, and (b) at the same time analogous products became significantly cheaper. Those facts are more than sufficient to conclude that Bayer's price increase was significant from an economic perspective.

24. Furthermore, Dr. Saravia commits the same error in her other attempts to minimize what is a clear and plain fact. She claims that Bayer's price increase was only 3.1% based on using CPI to "inflation-adjus[t] net price" and that the price change amounted to only "a 1.9% compound annual growth rate" (i.e., an average increase of nearly 2% each year for six years running). Even if one were to accept those misleading but smaller percentages, the fact is that her own calculations show Bayer was increasing its own prices while other newly introduced products saw double-digit percentage declines and price at double-digit percentage discounts relative to Bayer.

25. Relatedly, Dr. Saravia's insistence that a SSNIP must be measured in annual terms and a SSNIP must exceed 5% in a single year is wholly arbitrary, makes no economic sense, and accords to no actual economic principles.[19] Her purported "per annum" rule is arbitrary and plainly unreliable. For example, if a firm increases price by 4% and then increases price by another 4% on the 366th day thereafter, no economist would simply dismiss the significance of the two price increases because they were separated by one day above and beyond a year. Rather, economists would plainly understand that those facts show an 8.2% increase (i.e., 4% compounded twice) in what is practically (though perhaps not literally) a year. As another example, if that firm repeats its 4% price increase each and every year for five years running, the end effect is a 21.7% increase (i.e., 4% compounded five times). No reasonable economist would dismiss such a price increase as insignificant simply because the means used to implement the 21.7% increase in price did not exceed 5% in a particular year. Finally, as yet

[16] *See* **Exhibit 3A** showing a decline from $8.08 per dose in 2011 to $6.67 in 2016 for the average fipronil spot-on.

[17] [redacted]

[18] Wong Report, ¶ 82.

[19] Saravia Report, ¶ 106

another example, undoubtedly the length of time and durability of the price increase matters—looking at each year separately and applying a single yearly threshold does not address the persistence of the price and the overall behavior of the firm in its proper context. If a firm implements an 8.2% price increase over two years (via two 4% per annum increases) but then sustains it for three more, any reasonable economist will focus on the overall consequence and effect of that conduct, rather than some arbitrary year-by-year breakdown. The undisputed data in this case shows that Bayer raised its prices over time,[20] cumulatively that was a significant and sustained increase over time,[21] relative to analogous products the increase was even more significant,[22] and even after the six years of sustained increases, Bayer continued to increase prices thereafter.[23]

26. Moreover, Dr. Saravia's suggestion that Bayer's price increase be compared to the general economy-wide CPI is inappropriate and plainly unnecessary.[24] The economy-wide CPI measures things like whether the prices of food or electricity have increased for the average U.S. consumer. Whether those other products have or have not done so is not informative for this case given (a) there are ample measures (as I cite to) of how prices for specifically flea and tick treatments have changed over time, and (b) there are also measures of how the costs of supplying Bayer's own Advantage/Advantix products have changed over time. As I show above, the prices of other flea and tick products *declined* relative to the Bayer's own products. Further, the fact that Bayer's profit margins increased (and were generally quite high to begin with) shows that its costs stayed constant or even fell slightly. Whether the prices of food and electricity rose by 2% or 10% over time is not a relevant fact given the wide availability of indisputably better benchmarks for this case. The simple fact is that Bayer increased its prices while the industry was getting more competitive and analogous products were seeing declining prices. Bayer's divergent pricing direction from the rest of the industry (and sustained sales quantities) is a clear indication of the significance of its pricing behavior.

[20] *See* **Exhibit 3B**.

[21] *Id.*

[22] *See* **Exhibit 3A-3B**.

[23] *See* **Exhibit 3A** (showing price increases continue after 2016); Wong Report, **Exhibit 5A-5B**.

[24] Saravia Report, ¶ 107.

27. Finally, Dr. Saravia's assertion that Bayer's price increase would only be informative if it was instantaneous is another variation of her same flawed, clearly erroneous assertion that a brief window of time is more informative.[25] Again, if a firm spreads two 4% price increases over one week, no reasonable economist would dismiss the significance of what is clearly an 8% price increase simply because it was not a single instantaneous change. Such an arbitrary framework defies even the most basic economic and common sense. Real-world price increases are frequently carried out over time—economists look to the level, timing, and overall context with which they occur to determine their significance.[26] No reasonable economist would dismiss a sustained increase simply because it was not consolidated "at the moment" into a single discrete jump.

28. Even setting aside that obvious flaw, the fact is that there was effectively a significant, instantaneous price increase when generic fipronil products entered in 2011 (and another when generic imidacloprid products entered in 2016). As I explained in my initial report, that entry by generic competitors resets the competitive prices to a much lower level.[27] In relative terms, the sudden, drastic price difference that materializes is equivalent to an increase in price from an economic perspective. Consider this example of the approximate prices that wholesale customers faced before and after generic fipronil spot-ons entered in 2011.

Example III.B
Product Choices and Average Prices Faced by Wholesale Customers Before and After Average Generic Fipronil Entry in 2011

Product	Before Generic Entry	After Generic Entry	Relative Premium to Generic
Advantage/Advantix	$ 7.35	$ 7.35	53%
Frontline	$ 8.08	$ 8.08	68%
Generic Fipronil		$ 4.80	

29. In one instance (before generic entry), customers faced a choice of two products with somewhat similar prices. In another instance (following generic entry), customers faced a

[25] Saravia Report, ¶ 104 ("the appropriate application of the HMT posits a SSNIP that holds all else constant, which is only credible **at the moment of the test and certainly not over five years of prices** adjusting to changes throughout an industry") (emphasis added).

[26] Horizontal Merger Guidelines, § 4.1.2.

[27] Wong Report, ¶ 81.

third product choice with a price that was very significantly lower (and for what is essentially the same product as Frontline). That is, after the entry of generic fipronil, customers could get a comparable product much more cheaply, which is economically equivalent to a relative price increase of the incumbent products. The data show that Bayer, rather than reacting by lowering its prices to compete with the new and significantly cheaper products, (a) continued to maintain and (over time) raise its prices, and (b) managed to do so profitably without experiencing significant substitution toward those newer, cheaper, competitive products. This is but one of the multiple measures that show Bayer achieved a significant price increase in economic terms, both via an instantaneous increase in relative terms *and* via significant incremental increases in absolute and relative terms over the ensuing six years.

IV. The Facts Concerning Bayer's Sales Quantities Over Time for Advantage/Advantix

30. Real-world data in this case show that Bayer (a) maintained or slightly grew its sales quantities from 2010 to 2016 during the same period in which it raised prices for its products, and (b) maintained its sales quantities after 2016 significantly above the level it would have had it been exposed to further competition from generic imidacloprid spot-ons. These are important economic facts, as they help (a) confirm that Bayer held and exercised monopoly power up to 2016, and (b) provide evidence of the effects from Bayer's anticompetitive conduct after 2016.

31. Rather than dispute these fundamental facts, Bayer's economics expert, Dr. Saravia, deflects from the topic and, in the end, simply proposes an alternative data point for 2010 purporting to show that Bayer's sales declined 7.5% from 2010 to 2016.[28] Her data point is incorrect, but even setting this issue aside, her criticisms do not actually refute the key facts—particularly, the facts about Bayer's performance *relative* to Frontline. She does not actually dispute the fact that Bayer maintained or grew its sales quantities relative to Frontline's own sales quantities, which declined precipitously when exposed to generic fipronil competition. Even by Dr. Saravia's own numbers (which are incorrect), Bayer's sales declined by only 7.5%, whereas Frontline declined by 57.6% over the exact same time period from 2010 to 2016.[29]

[28] Saravia Report, ¶ 114.

[29] **Exhibit 4.**

Likewise, looking at 2011 to 2016 (i.e., setting aside the lone data point in dispute and only looking at undisputed data), Bayer's sales quantity changed by less than 1%, whereas Frontline's declined by more than 50% over the exact same time period.[30]

32. Furthermore, Dr. Saravia does not dispute the stark comparison between the changes in Bayer's and Frontline's sales quantities when competing with their own generic equivalents respectively. Based only on undisputed data, Bayer's sales quantities declined by only 23% after five years of generic imidacloprid competition (i.e., from 2016 to 2020), whereas Frontline declined by 48% after five years of generic fipronil competition (i.e., from 2011 to 2015).[31] The plain, undisputed data show that Bayer's conduct worked to minimize the impact of generic competition, in contrast to what economic theory and Frontline's analogous history show should have occurred. As with prices discussed above, Dr. Saravia's criticism (a) does not actually deny the key facts, and (b) relies on a results-oriented approach that is not in keeping with sound economic analyses or principles.

A. Dr. Saravia Concedes that Bayer Saw Minimal Changes in its Sales Quantities from 2010 to 2016

33. [redacted]

34. Dr. Saravia disputes only the 2010 quantity data point, claiming that her estimate of 43.8 million doses in 2010 is superior.[34] In proposing this alternative, she attempts to justify

[30] *Id.*

[31] Wong Report, **Exhibit 7B**.

[32] *Id.*

[33] *Id.*

[34] Saravia Report, ¶ 114.

her opinion simply by calling my estimate "arbitrary and unreliable."[35] This characterization is improper and more of the same results-oriented approach from Dr. Saravia. It cannot be that her estimate (which relies on the same business document as my calculation) is believable but my calculation is not. In reality, she simply chooses a different set of economic assumptions to interpret the document.[36] Her efforts to mischaracterize my presentation of plain data and straightforward analysis are not appropriate—the facts do not align with her preferred result, and rather than address them for what they are, she attempts to distract and deflect the discussion.

35. In any case, her dispute over the single 2010 data point has no actual bearing on the overall facts or the appropriate conclusions one should draw in this case. Whether by her 2010 number or my 2010 number, the data show that Bayer's sales quantities changed no more than 7.5% (in either direction) from 2010 to 2016, and the midpoint between the two disputed data points implies a mere 0.1% change. Furthermore, based on the 2011 data that are not in dispute, Bayer's sales quantities changed by less than 1% from 2011 to 2016. In short, all of the data (even the numbers most favorable to Dr. Saravia's preferred estimate) show that Bayer's sales quantities did not change significantly over period from roughly 2010 to 2016. That is the key fact—despite Bayer's significant price increases and growing competition in the industry generally, Bayer succeeded in maintaining its sales quantities. In comparison, basic economic theory shows that increasing prices and increasing competition should have decreased Bayer's sales quantities—thus, Bayer's conduct was an exception and the opposite of what free and fair market competition is supposed to achieve.[37]

36. Relatedly, whether Bayer's sales increased or decreased slightly is beside the point once one compares Bayer's history to that of Frontline. Even by Dr. Saravia's preferred numbers showing a 7.5% decline from 2010 to 2016 and the undisputed data showing a 0.7%

[35] *Id.*

[36] [redacted]

[37] Pindyck, R. S., and Rubinfeld, D. L., *Microeconomics*, 9th ed., Upper Saddle River, N.J.: Pearson/Prentice Hall, 2017, pp. 290 ("Entry and Exit"), 365-367 ("Sources of Monopoly Power").

decline from 2011 to 2016, Bayer's minimal change in sales quantity far exceeds what was experienced by Frontline. Over the same period, Frontline's own sales quantities (which are also undisputed data) declined by 57.6% and 54.8% from 2010 and 2011, respectively, to 2016. This shows that Bayer outperformed Frontline by at least 50 percentage points despite (a) Bayer instituting similar or larger price increases than Frontline, and (b) both being exposed to greater industry-wide competition. The relative comparison is key—whereas Frontline's sales confirm the effects of increasing competition were present in the industry, Bayer maintained its sales quantities despite being subject to those same competitive conditions.

B. All Specifications of the Difference-In-Difference Regressions Show No Statistically Significant Change in Bayer's Sales Quantities Until 2016

37. [redacted]

[38] Wong Report, ¶¶ 87-88.

[39] **Exhibit 4**; *see also* Wong Report, **Exhibit 7A-7B**.

[40] Wong Report, **Exhibit 7A-7B**.

[redacted]

38. But even setting aside the fact that conclusions based on comparing Frontline and Bayer are plainly clear, I showed in my initial report that straightforward, well-accepted statistical methods also confirm the same above facts. I return shortly in **Section V** to discuss these methods more generally and the breadth of economic literature supporting them. Here, however, I present some additional regression results to demonstrate that the above two facts can be shown even using Dr. Saravia's preferred data and addressing her seeming confusion about regressions generally. In short, Dr. Saravia's criticisms of my regression analysis do not actually have any substantive effect on the results, and they do not change the reality that the regressions merely reconfirm the above clear, plain facts concerning Bayer's and Frontline's sales history.

39. First, Dr. Saravia criticizes my regression results "due to the lack of data on Bayer's sales prior to 2011."[41] This is an unfounded criticism, and she does not show that it matters in any meaningful way (it does not). In **Exhibit 5**, I present regression results based on the inclusion of Bayer's 2010 sales (i.e., including sales "prior to 2011" as Dr. Saravia suggests is needed). The exhibit presents side-by-side (a) my original results, (b) results using my calculation of Bayer's 2010 sales, and (c) results using Dr. Saravia's own estimate of Bayer's 2010 sales.[42] There is no meaningful change across any of these regressions—the coefficients are nearly identical in magnitude, the statistical significance has no meaningful change, and the R-squared (measuring the explanatory fit of the regression) remains above 0.9. In short, with or without the 2010 Bayer sales data point (and even using Dr. Saravia's own data), the regressions confirm the above two facts: (a) Frontline experienced a statistically significant impact from generic fipronil competition, whereas Bayer did not; and (b) Bayer's only significant impact was

[41] Saravia Report, ¶ 117.

[42] I show one set of specifications based on the first three regressions shown in **Exhibit 8A** of my initial report. My backup presents the remaining specifications. There is no meaningful change for any specification when comparing my initial results and any of the results here including Bayer's 2010 sales.

from generic imidacloprid competition, but the magnitude of that impact is only half that of the comparable own-generic effect experienced by Frontline.

40. [redacted]

[43] In that specification, the percentages are normalized to each company's 2011 sales. In other specifications, the units of measure change, but the interpretation and conclusions that should be drawn are virtually identical.

41. Dr. Saravia does not seem to understand these results—neither the proper way to compute the effect to each company nor the proper way to determine the statistical significance of the effects. In one place, she claims (wrongly) that the results are only statistically significant in "seven of the eighteen regressions"[44]—that is simply not so. The proper way to read the regression tables is based on the overall, accumulated effects from competition that are shown at the bottom of each table. For example, the specification in Column (4) of **Exhibit 8A** of my initial report shows that Frontline experienced a statistically significant effect of -6.7 percentage points per year in 2011-2012, a statistically significant effect of -14.0 percentage points per year in 2013-2015, and a statistically significant effect of -2.9 percentage points per year in 2016-2020. That is, in each and every year, Frontline experienced some statistically significant loss in sales due to competition from various (and growing) sources. In comparison, in that same specification, Bayer did not experience any statistically significant impact to its sales in 2011-2015, and Bayer saw a statistically significant impact of only 5.3 percentage points per year in 2016-2020 (i.e., half of the analogous -6.7 to -14.0 percentage point effects on Frontline). Across all eighteen specifications, the regressions show that Frontline experienced statistically significant losses in sales in 30 of the 36 estimates presented in my initial report. In comparison, across those same eighteen specifications, Bayer experienced statistically significant loss in sales only after 2016 and only in 4 of the 36 estimates presented in my initial report. The regressions in my initial report consistently show large, statistically significant declines in sales for Frontline due to competition and comparatively small, statistically insignificant declines in sales for Bayer despite exposure to the same competition.

42. In another place, Dr. Saravia claims (wrongly) that the regressions show "Frontline sales increased by around 10–11 percentage points after 2016"[45]—again, that is simply not so. Looking again at the specification in Column (4) of **Exhibit 8A** of my initial report, she appears to be referring to the regression results of -0.047 and 0.158 (and adding those to get 0.111=-0.047+.0.158). Taking those two results in a vacuum is simply not the correct way to read the table or interpret the results. The actual effect to Frontline in 2016 to 2020 is the accumulated effect of all six coefficients listed in that column, which is a 2.9% effect per year (i.e., 0.029=-0.017-0.050+0.011-0.084-0.047+0.158), as shown at the bottom of the table. Her

[44] Saravia Report, ¶ 123.

[45] Saravia Report, ¶ 121.

criticism cites to only two of the six numbers that must be interpreted together. In effect, what she has done is no different than taking two words out of context from six-word sentence—the flaw is not in the results themselves but in Dr. Saravia's act of moving the results out of their proper context.[46]

43. [redacted][48]

C. Dr. Saravia Concedes that Bayer Sales Declined Only Half the Amount of Frontline when Exposed to Own-Generic Competition

44. Dr. Saravia never acknowledges the latter of the two facts listed immediately above. This omission is crucial—she does not contest a key fact showing the effect of Bayer's alleged conduct after 2016. That is, starting in around 2016, Bayer's anticompetitive conduct prevented generic imidacloprid competitors from competing against Bayer's Advantage/Advantix products. In turn, that restraint on competition prevented substitution away from Bayer's products and toward generic imidacloprid competitors, helping to support Bayer's sales and minimize its loss of sales quantities. That lessening of competition caused by Bayer—

[46] Her criticism is analogous to taking the following sentence that starts her report "My name is Celeste C. Saravia." and only quoting "name is." Clearly "name is" makes no sense in isolation. But taking the two words out of context does not change the reality of her otherwise clear six-word sentence.

[47] Wong Report, ¶¶ 87-88.

[48] *See, e.g.*, Wong Report, **Exhibit 8A** at Column (4) showing a -5.3% per year effect after generic imidacloprid entry for Bayer from 2016 to 2020, which is about half the magnitude of the analogous effects to Frontline after generic fipronil entry and Seresto entry of -6.7% per year from 2011 to 2012 and -14.0% per year from 2013 to 2015.

for which there is no evidence of Frontline doing the same—explains why Frontline lost nearly 50% of its sales in the first five years of competition with its own generic products, and yet Bayer lost less than half that amount (22.5%) over the first five years of competition with its own generic products. Dr. Saravia is entirely silent on this question—she does not dispute the data; she does not question the result; and she does not deny the importance of this comparison.

V. My Initial Report Shows an Application of Well-Accepted Economic Methods to Analyze Bayer's Prices and Sales Quantities Over Time

45. Bayer's economics expert, Dr. Saravia, attempts to discredit my straightforward analyses of Bayer's pricing and sales quantities over time. Dr. Saravia claims that that "the price changes [I] examine are not a natural experiment," and that my regressions "are not difference-in-differences regressions" and "cannot distinguish the effects of interest from those of confounding factors."[49] Neither contention by Dr. Saravia is correct, and her characterizations misrepresent wide swaths of the economics literature. In this section, I explain that the expiration of Frontline's patent *is* a natural experiment according to well-established definitions in the economics literature and common applications found in analysis of antitrust cases. I also explain that Dr. Saravia's characterization of my regression analysis is wholly inappropriate and misleading—the methods I use to statistically quantify the difference in the trends for Bayer's Advantage/Advantix and Frontline (*see* Wong Report, **Exhibits 7A and 7B**) *do* constitute a valid and credible difference-in-differences regression. Dr. Saravia suggests an incorrect and arbitrarily narrow definition of difference-in-difference analysis and numerous times fails to characterize and interpret my regressions correctly.

46. While my statistical analysis is empirically sound and reliable, it is also true that all of my conclusions follow directly from straightforward comparisons of average prices and quantities over time. In fact, the plain and clear evidence I present in my initial report (and reiterate above) is so striking and the magnitudes so evident that further statistical analysis is not necessary to understand the significance of the results. In that sense, my statistical analysis is simply further confirmation of historical facts for which the economic and real-world

[49] Saravia Report, ¶¶ 12a, 118, and 120.

significance is already clear. Dr. Saravia's ill-founded critiques of my methods are merely an attempt to distract from and inappropriately discredit this straightforward, conclusive evidence.

A. Bayer's Prices and Sales Quantities Can Be Analyzed Using Very Simple, Straightforward Methods

47. The basic evidence on prices and sales quantities presented in my initial report and reiterated above are conclusive on their own. The evidence I provide consists straightforwardly of averages and simple comparisons of prices and wholesale sales quantities—e.g., I simply show how Bayer's sales quantities have changed over time and compare those to Frontline's. From this simple but powerful evidence, I draw important conclusions, including that (a) Bayer's conduct from 2011 to 2016 satisfies the hypothetical monopolist test ("HMT"), (b) fipronil spot-on products and other flea and tick treatments are appropriately excluded from the relevant market, and (c) Bayer's modest loss in sales despite its own generic imidacloprid entry after 2016 is consistent with significant foreclosure of those generic imidacloprid competitors.

48. Although the entry of generic fipronil satisfies the definition of a natural experiment, evidence on Bayer's prices from 2011 to 2016 is conclusive irrespective of that question and irrespective of more advanced statistical methods. For example, **Example III.B** above provides a clear illustration of the simplicity and reliability of the factual evidence on prices. The example shows that generic fipronil entry created a sudden 53% price premium for Advantage/Advantix. This is a sudden, large, and economically meaningful increase in relative prices that arises due to the expiry of Frontline's patent protections, which Dr. Saravia herself agrees is an exogenous shock.[50] Likewise, as another example, **Exhibits 3A and 3B** above show straightforward evidence of other increases in Bayer's prices from 2011 to 2016, both in absolute and relative terms. None of the plain facts documented in these tables rely on complex statistical framework or methods—the tables simply show a factual accounting of the real-world data based on averages and sums.

49. Similarly, the evidence on sales quantities for Advantage/Advantix presented in my initial report and above is also conclusive even without more advanced methods. **Exhibits 7A and 7B** in my initial report and **Exhibit 4** above present wholesale sales quantities for

[50] Saravia Report, ¶ 98.

Advantage/Advantix from 2010 to 2020 and Frontline from 2009 through 2020. Again, these tables simply show a factual accounting of the real-world data based on averages and sums. The straightforward evidence shows that sales of Advantage/Advantix did not significantly decline (and instead likely grew) after the entry of generic fipronil in 2011 and up to 2016.[51] And the straightforward evidence also shows that the sales of Frontline declined substantially over the same exact period.[52] As discussed above, this is a fact that Dr. Saravia does not actually dispute. These empirical facts are striking, and they are dispositive without any additional statistical analysis, as I have stressed since my initial report.[53]

50. Further still, the same straightforward evidence on sales quantities is also informative as to the impact of Bayer's conduct and the degree of foreclosure the conduct caused. **Exhibits 7A and 7B** in my initial report and **Exhibit 4** above show that generic imidacloprid entry had a much smaller impact on the sales of Advantage/Advantix than generic fipronil entry had on the sales of Frontline over analogous periods of time. Again, the difference between the experience of the two products is large and plainly visible in the figures and tables, and quantifying the difference relies on simple arithmetic.[54] And, as I discuss below, the difference is so large that it cannot be explained by the small, supposed differences in supply and demand conditions that Dr. Saravia claims.

B. Bayer's History Relative to Frontline Is a Clear Natural Experiment

51. While my results and conclusions are in no way dependent on the use of the term "natural experiment," the expiration of Frontline's patent *is* a natural experiment according to well-established definitions in the economic literature and common applications found in antitrust cases. Dr. Saravia quotes the definition of natural experiments given in the 2021 Nobel Prize in Economic Sciences, stating that they are "situations arising in real life that **resemble**

[51] [redacted].

[52] Frontline's sales quantities were 72.9 million doses in 2010, 68.5 million in 2011, and 30.9 million in 2016 (Wong Report, **Exhibit 7B**).

[53] Wong Report, ¶ 89.

[54] [redacted]

randomized experiments."[55] She goes on to say that a study using observational data must meet the following criteria to be considered a natural experiment:[56]

a) A natural experiment must have an exogenous event that affects the observed groups.

b) The event must split the subjects into a "control" and a "treatment" group so that only the "treatment" group is affected by the event.

c) The researcher must observe the "control" and "treatment" groups before and after the event.

d) Either the event must be the only change occurring during the relevant period or it must be possible to control for other factors that affected outcomes.

The natural experiment that I analyze fits the above definition as well as other common definitions, including the definition provided in the federal antitrust agencies' *Horizontal Merger Guidelines*.

52. In this subsection, I discuss each of Dr. Saravia's criteria and show that her definition of a natural experiment is overly narrow and does not reflect the common understanding of natural experiments in the economic literature. With respect to Dr. Saravia's requirement that researchers observe groups in a pre-/post-period dichotomy, I also note that Dr. Saravia has conflated the more general term "natural experiment" with one specific econometric technique that can be used to statistically analyze some natural experiments. Finally, I show that the entry of generic fipronil (and the history I study more generally) satisfies even Dr. Saravia's overly narrow criteria for being considered a natural experiment, and I provide examples of observational studies that have used generic entry as natural experiments.

53. First, the entry of generic fipronil fits the Nobel Committee's definition of a natural experiment. Randomized experiments are designed to evaluate a hypothesis. For example, an experiment designed to test the hypothesis that a new drug improves patient health might involve randomly assigning some patients to receive the drug and others to receive a placebo.[57] If the hypothesis is true, one will observe the health of the treatment group is better than that of the control group. If the hypothesis is false, one will observe the health of the two

[55] Saravia Report, ¶ 97 (emphasis added).

[56] Saravia Report, ¶ 97.

[57] Alternatively, the experiment could involve giving different drugs to different groups of patients, or different doses of the same drug. There are innumerable combinations of possible "treatment and control" (or "differential treatment") that are used and widely accepted.

groups is the same. By comparing the treatment and control group, a scientist can accept or reject the hypothesis.

54. In the case of Bayer and Frontline, it is possible to test a hypothesis against real-world outcomes, just as one would do in a randomized experiment. In fact, there are two main hypotheses that can be tested:

a) One hypothesis to be evaluated is the claim that Advantage/Advantix is in the same market as fipronil-based products. Economic theory tells us that the entry of generic fipronil products will have a different impact on Bayer and Frontline if the hypothesis is true or false. If the hypothesis is true, Advantage/Advantix and Fipronil will both experience a substantial loss of sales. If the hypothesis is false, the sales of Advantage/Advantix will not be significantly affected, and the experience of Advantage/Advantix will differ from that of Frontline. The two different predictions enable one to test the hypothesis against real-world outcomes, just as one would do in a randomized experiment.

b) A second hypothesis to be evaluated is the claim that Bayer did not significantly foreclose competition from generic imidacloprid. If the hypothesis is true and Bayer's conduct did not foreclose competition, one would expect the experience of Advantage/Advantix after the entry of its own generic imidacloprid to approximately follow that of Frontline after the entry of its own generic fipronil. If the hypothesis is false and Bayer's conduct did significantly foreclose competition, one would expect Bayer's sales to decline by significantly less than Frontline's. Again, the two different predictions enable one to test the hypothesis against real-world outcomes, just as one would do in a randomized experiment.

55. Frontline plays a valuable role as the "control" group in both hypothesis tests (i.e., the "natural experiments"). In the first hypothesis, Advantage/Advantix is the "treatment" group because it is being shocked by a product different from itself, and Frontline is the "control" group because it is being shocked by a product the same as itself.[58] In the second hypothesis,

[58] The assignment of "treatment" and "control" labels is arbitrary and simply an expositional tool. The "control" is merely the baseline against which the "treatment" is measured. For example, in an experiment where one group is given a drug and a second group is given a placebo, one could label the placebo the "control." In that case, the measured effect is the incremental effect of the drug as compared to the placebo. But the experiment is unchanged if one labels the drug "control." In that case, the measured effect is the incremental lack of effect of the placebo as compared to the drug.

Advantage/Advantix is the "treatment" group because it is the product subject to the alleged conduct, and Frontline is the "control" group because it is the product not subject to the alleged conduct. Just as the control group in a randomized drug trial serves as a baseline to measure the effects of a drug, Frontline's experience serves as a baseline with which to test the key issues of this case. Furthermore, as the data show, Frontline's experience establishes a baseline that is consistent with well-accepted economic theory and similar to many economic studies of other pharmaceutical products.[59]

56. [redacted].[62]

57. While the entry of generic products clearly satisfies the Nobel Committee's definition, it also satisfies the federal antitrust agencies' definition. In fact, the *Horizontal Merger Guidelines* mention entry as an example of a historical event that gives rise to a "natural experiment" that is informative for things, such as evaluating competitive effects:

> The Agencies look for historical events, or 'natural experiments,' that are informative regarding the competitive effects of the merger. For example, the

[59] Wong Report, Section III.B.

[60] Of course, products can be impacted by the same forces of supply and demand without being in the same relevant antitrust market. For example, hospitals in two different geographic markets would be commonly affected by many nationwide shocks (e.g., demographic changes or changes in operating costs) even though patients do not substitute between the two.

[61] [redacted]

[62] [redacted]

> Agencies may examine the impact of recent mergers, entry, expansion, or exit in the relevant market. Effects of analogous events in similar markets may also be informative.[63]

Further, another economic article explains that the federal antitrust agencies commonly rely on evidence from natural experiments to analyze antitrust cases,[64] and an empirical review of the use of natural experiments in FTC merger investigations went as far as to report that "entry experiments are regularly evaluated in the pharmaceutical industry, where medical effectiveness often suggests that market competition is limited to firms selling products with the same type of active ingredient."[65] Thus, it is clear that my analysis satisfies multiple definitions of a natural experiment. In contrast, Dr. Saravia attempts to mischaracterize my analysis and inappropriately compare it to an overly narrow definition of "natural experiment" that deviates from the above source that she herself cites.

58. Dr. Saravia's first criterion in her definition of a "natural experiment" is that it must be predicated on an exogenous event. I agree that natural experiments typically rely on an event that is reasonably exogenous, and Dr. Saravia agrees that the expiration of Frontline's patent protections and the entry of generic fipronil satisfy this requirement.[66] However, she proceeds to express the mistaken belief that the existence of *any* non-exogenous variation whatsoever is disqualifying.[67] If this were the case and literally any modicum of non-random change is disqualifying, there can be no natural experiments. By definition, natural experiments do not take place in a laboratory and are not pure randomized controlled trials—regular economic activity continues during all natural experiments. For example, in the Mariel Boatlift study that Dr. Saravia cites as an example of a natural experiment, the arrival of immigrants from Cuba to Miami created exogenous variation in immigration, but immigrants did not stop arriving in Miami and neighboring areas, driven by other reasons, during the pendency of the natural

[63] Horizontal Merger Guidelines, § 2.1.2.

[64] Coate, Malcolm B., "The Use of Natural Experiments in Merger Analysis", *Journal of Antitrust Enforcement,* Vol. 1, No. 2, 2013, pp. 437-467 at 38-39 ("'Natural experiments', defined as historical events that link changes in competitive conditions to changes in market performance, represent the strongest type of evidence, because these factors involve the study of the impact of specific shocks (changes in either structure or firm conduct) on the market.")

[65] Coate (2013), pp. 437-67 at 48.

[66] Saravia Report, ¶ 98. "While the entry of generic fipronil topicals may be thought of as exogenous (because it was predicated by expiry of BI's patents for fipronil), Bayer's pricing cannot. Bayer's pricing was the result of strategic decisions dependent on market conditions and developments and, thus, are not exogenous in the sense required for natural experiments."

[67] *Id.*

experiment. Similarly, the study of minimum wages cited by the Nobel Committee studied exogenous variation in restaurant workers' wages caused by a change in the minimum wage in New Jersey, but ongoing regular economic activity, including strategic decisions made by restaurant owners, also affected the wages of restaurant workers at the time. According to Dr. Saravia's purported criterion, the very examples of natural experiments that she herself cites would be "not" natural experiments.

59. Dr. Saravia's second criterion is that natural experiments must split subjects into a binary "control" and "treatment" group, with only the "treatment" group affected by the event. This definition is incorrect and arbitrarily narrow. The literature is rife with studies in which natural experiments lead to non-binary treatment and control groups and/or non-binary intensities of treatment. Studies frequently involve changes in the intensity or nature of a treatment across groups, just as in the case I analyze. For example, another study cited by the Nobel Committee studies the impact of schooling on earnings by exploiting compulsory schooling laws.[68] In this study, the intensity of treatment is determined by the interaction of each individual's birth date with compulsory schooling laws, giving rise to a continuum of treatment groups with varying intensity of treatment—the study contains no completely unaffected (i.e., "untreated") control group. In fact, Dr. Saravia seems to be aware that her second criterion is overly narrow even as she proposes it. In her report, she quotes and summarizes a popular textbook by saying that in reference to natural experiments, "Sometimes there is no explicit 'control' group and varying levels of 'treatment' groups are studied."[69]

60. Dr. Saravia's third criterion is that the researcher must observe the "control" and "treatment" groups before and after the event. This criterion is blatantly incorrect. Many of the most cited natural experiments in the economics literature and some of those cited by the Nobel Committee do not even involve analyzing changes in outcomes over time.[70] Natural experiments

[68] Angrist, Joshua D. and Krueger, Alan B., "Does Compulsory School Attendance Affect Schooling and Earnings?", *The Quarterly Journal of Economics*, Vol. 106, No. 4, 1991, pp. 979-1014.

[69] Saravia Report, n. 243.

[70] Consider, for example, Angrist's study of a military draft lottery, also cited by the Nobel Committee, exploits cross-sectional variation in the probability of military service due to the design of the Vietnam war draft lottery. There is no such thing as a pre- and post-period in this experiment, and Angrist's analysis consists of comparing the wages of individuals with different draft lottery numbers. *See* Angrist, Joshua D., "Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records," *American Economic Review*, Vol. 80, No. 3, 1990, pp. 313-36. It is also common to use geographic variation rather than variation across groups over time. In a classic and oft-cited natural experiment, Black's study compared housing prices across school district lines to measure the willingness to pay for school quality. *See* Black, Sandra E., "Do Better

can be (and have been) analyzed using a number of different empirical strategies, including first-differences, difference-in-differences, instrumental variables, and regression discontinuity. Dr. Saravia's third criterion has no merit, let alone probative value in determining whether generic entry is a natural experiment. Even still, I address this claim and other critiques of my difference-in-differences analysis in **Sections V.D and V.E** below, and I show that her alleged concerns with my analysis are unfounded and contrary to well-accepted economics.

61. Dr. Saravia's fourth criterion for natural experiments is that the exogenous event must either be the only change occurring during the relevant period or controls must be employed to absorb other changes. First, again, it is never the case that natural experiments are the only change occurring during a period under study. As I mention above, natural experiments give rise to exogenous variation in real-life settings, and it is well-understood that regular forces of supply and demand continue to act in the background. Dr. Saravia seems to recognize this, as she quotes from a popular economics textbook, "In any study there will be omitted variables that may have also changed in the time interval between policy change and its impact."[71] Second, it is important to carefully consider whether other factors could have given rise to the observed outcomes when interpreting the results of any empirical analysis, including those based on natural experiments. I have carefully considered alternative factors, and in my initial report I explain that there are no other plausible explanations for the empirical facts that I document.[72] In **Section V.C** below, I also directly address each of the supposed factors Dr. Saravia claims as possible confounding factors. Her alleged confounding factors are entirely speculative and cannot explain the observed outcomes of Advantage/Advantix and Frontline. Further, it is telling that she provides no actual empirical analysis to show any of her claimed confounding factors actually impacts the analysis.

62. Overall, there are numerous, clear ways to show that Dr. Saravia's definition of a "natural experiment" is incorrect and misleading. I used the term natural experiment correctly in my initial report and in accordance with the economic literature. In fact, there are studies that analyze pharmaceutical product entry as a natural experiment in the economics literature. For

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Schools Matter? Parental Valuation of Elementary Education," *The Quarterly Journal of Economics*, Vol. 114, No. 2, 1999, pp. 577-599.

[71] Saravia Report, n. 245.

[72] Wong Report, ¶ 83.

example, Bairoliva et. al. (2017) study a natural experiment arising from generic entry in the market for human osteoporosis drugs.[73] Ellyson and Basu (2018) is another example that studies a natural experiment arising from insulin drugs passing clinical trial thresholds.[74] And as I cite above, in an article studying antitrust matters at the FTC, a senior FTC economist noted that "**entry experiments are regularly evaluated in the pharmaceutical industry**, where medical effectiveness often suggests that market competition is limited to firms selling products with the same type of active ingredient."[75]

C. Dr. Saravia's So-Called "Confounding Factors" Are Speculation and Do Not Change the Clear Facts That I Documented

63. Dr. Saravia asserts without any actual analysis that "confounding factors" invalidate my analyses and thus they "cannot support [my] conclusions regarding market definition"[76]—that is simply not so as a matter of economic theory or as a matter of empirics. She claims that "significant changes that occurred during 2011–2016…would have affected demand for flea and tick topicals."[77] While it is generally true that one should consider whether confounding factors affect an analysis, I have done so and have, indeed, addressed and controlled for potential confounding factors. Dr. Saravia fails to demonstrate whether and how her purported confounding factors actually have a significant impact on my regression analyses. Her effort to trump up so-called "confounding factors" amounts to little more than speculation on her part, and her claims contradict other claims she makes, such as her assertion that imidacloprid and fipronil spot-ons belong in the same relevant market.

64. First, this is not a dispute about the method employed—it is perfectly appropriate for me (or any reasonable economist) to compare the historical trends in sales of Bayer's Advantage/Advantix and Frontline, and it is perfectly appropriate to analyze how the two responded to the entry of generic fipronil and other products. Moreover, it is appropriate to draw conclusions about the relative substitutability of imidacloprid and fipronil products based on

[73] Bairoliya, Neha, Karaca-Mandic, Pinar, McCullough, Jeffrey S., and Petrin, Amil, "Consumer Learning and the Entry of Generic Pharmaceuticals", *NBER Working Paper Series*, No. 23662, 2017, pp. 2-49.

[74] Ellyson, Alice M., and Basu, Anirban, "The New Prescription Drug Paradox: Pipeline Pressure and Rising Prices", *NBER Working Paper Series*, No. 24387, 2018, pp. 1-54.

[75] Coate (2013), pp. 437-67 at 48.

[76] Saravia Report, ¶¶ 100 and 120.

[77] Saravia Report, ¶ 100.

historical data and facts drawn from multiple calculation methods. Dr. Saravia may believe that other factors explain some of the difference in sales trends for the two branded products, but that is her subjective opinion and I disagree with her. She is wrong and unwarranted to claim that her own subjective opinion renders my straightforward analyses of real-world data "fatally flawed."[78] Quite the contrary, her efforts to overstate the importance of "confounding factors" without any demonstration that they are economically and statistically significant is the true "fatal flaw."

65. Second, the effect of generic fipronil entry on the sales of Frontline but not on the sales Advantage/Advantix is large in magnitude, consistent with economic theory, coincident with the key event being studied, and quantified by multiple methods (not just regression). There is simply no empirical or methodological sign even suggesting that Dr. Saravia's contentions have merit. The consistency between the results and the economic theory, and the robustness of the results across different methods are important, credible signs that confounding factors have been addressed and there are *not* spurious explanations for the results I present. In short, the facts that I document and the conclusions that I draw from those facts rely on a variety of methods and economic teachings—her efforts to nitpick a single statistical analysis from among multiple analyses that I have done are just that, attempts at nitpicking to no actual ultimate point or effect.

66. Third, the statistical analysis depends on a relative comparison that—by design—controls for multiple of her so-called confounding factors. Any alleged factor that shocks both Bayer and Frontline in approximately parallel manner *is* controlled for by studying each product's trend (i.e., the change over time) and then comparing those trends.[79] For example, if general economy-wide inflation raised the costs of production, it would impact all firms (e.g., resources cost more, workers earn higher wages, etc.) and, thus, all products in the flea and tick industry. Comparing two products within the industry and analyzing how those products changed at parallel points in time addresses any general concern about inflation. Dr. Saravia provides no

[78] *Id.*

[79] Lechner, Michael, "The Estimation of Causal Effects by Difference-in-Difference Methods," *Foundations and Trends in Econometrics*, Vol. 4, No. 3, 2011, pp. 165-224 at p. 168 ("The idea of this empirical strategy is that if the [treated and control] groups are subject to the same time trends, and if the treatment has had no effect in the pre-treatment period, then an estimate of the 'effect' of the treatment in a period in which it is known to have none, can be used to remove the effect of confounding factors to which a comparison of post-treatment outcomes of treated and nontreated may be subject to."); Abadie, Alberto, "Difference-in-Difference Estimators," *The New Palgrave Dictionary of Economics*, Palgrave Macmillan, 2008, at p. 2 ("an equivalent formulation of the DID assumption is that, in the absence of the treatment, average outcomes for treated and untreated would have followed a common trend. As a result, the untreated **comparison group can be used to infer the counterfactual evolution of the average outcome** for the treated in the absence of the treatment.") (emphasis added).

concrete support as to why Frontline experienced such a large decline in sales between 2011 and 2016 due to alleged general confounding factors and yet Bayer's Advantage/Advantix (a product in the same industry) was insulated from these same general factors. Similarly, these general factors do not (and cannot) explain the consistency of the results over time and the ability of the results to match the economic theory I cite to—the reality is that there is a persistent and growing gap in the sales trends between Bayer and Frontline, and economic theory predicts those effects are related to competition (or a lack of competition in Bayer's case), just as I show.

67. Fourth, even taken one by one, each of Dr. Saravia's confounding factors is flawed and/or self-contradictory, and there is no basis to think they significantly affect my results. I consider here each of the claimed factors and explain why none of them are actual concerns.

68. [redacted]

[80] Saravia Report, ¶ 100a.

[81] *Id.*

[redacted]

69. Dr. Saravia's second purported confounding factor is that "many other flea and tick products were launched in 2011–2016."[82] Here, the term "confounding" is not even correct—I did account for the potential competitive effects of these products in my analysis. Again, most regression specifications explicitly include a differential effect accounting for the entry of Seresto (and orals, generally) in 2013, and those regressions show results consistent with the ones without that control. And she is simply wrong in claiming that "[my] (otherwise flawed) results become statistically insignificant in most cases"[83]—as I explained in **Section IV.B**, she misreads (or intentionally mischaracterizes) my regression tables. Moreover, Dr. Saravia fails to offer any explanation why these products, representing common shocks to the competitive environment for the flea and tick industry, are severely detrimental to Frontline's sales but they barely affect Bayer's. Again, the analysis looks at the relative comparison of the two products, showing how their sales trends diverged *despite* being exposed to similar shocks.

70. [redacted]

[82] Saravia Report, ¶ 100b.

[83] *Id.*

[84] Saravia Report, ¶ 100c.

[85] Wong Report, **Exhibit 4A**; *see also* Wong Report, **Exhibit 4B** showing the yearly vet percentages specific to Advantage, Advantix, and Frontline.

Frontline in parallel. It cannot explain the significant growing divide comparing the two to one another. Second, relatedly, I addressed this change in my initial report.[86] Dr. Saravia is wholly incorrect to claim that this so-called confounding factor is ignored and is a significant concern. I did consider the shift away from vets and my empirical approach addresses it. The reality (though perhaps not to Dr. Saravia's liking) is that Bayer and Frontline had similar shifts in strategy and this is not a primary explanatory driver of the historical facts that I document.

71. Dr. Saravia's fourth purported confounding factor is that "Bayer and Merial/BI invested heavily in their topical brands' advertising."[87] Here too, the economics and the factual data are contrary to her claim. If both Bayer and Frontline "invested heavily" in advertising as she herself states, it cannot explain the divergence in sales trends comparing them. Moreover, as I discuss below, Frontline spent *more* on advertising than did Bayer.[88] It cannot be that these two branded products belong in the same relevant market as Dr. Saravia claims they do, since the data she herself submitted show that Frontline experienced significant declines despite advertising more, whereas Advantage/Advantix was insulated from the same effects of competition from other products despite advertising less. These facts actually strengthen the conclusions I draw—they show an even stronger divide between imidacloprid and other products and an even greater monopoly power by Bayer.

72. Dr. Saravia's fifth purported confounding factor is that Merial's distributor (PetIQ) might have had incentives that were not aligned with Merial's because "PetIQ's success as a generic manufacturer and its direct competition with BI's [i.e., Merial's] Frontline products would have affected its incentives."[89] This argument is completely speculative and incoherent as an economic matter. Dr. Saravia would have one believe that (a) despite PetIQ accounting for only 2% to 22% of Frontline's sales distribution from 2010 to 2016, PetIQ was successful in steering customers away from Frontline (in favor of its own generics) such that it single-handedly accounts for the 50% or more decline from 2010 to 2016; and (b) Merial (a large sophisticated company) increasingly relied on PetIQ as its distributor despite PetIQ's supposed

[86] Wong Report, ¶¶ 30-31 and 40.

[87] Saravia Report, ¶ 100d.

[88] Saravia Report, Exhibit 20 backup data. This shows more advertising spending for Frontline over the period 2011-2016 and over the period 2011-2019.

[89] Saravia Report, ¶ 100e.

harmful efforts against Merial. At bottom, Dr. Saravia's claim amounts to speculation that is wholly divorced from reality and assumes Merial is severely irrational from an economic perspective—that makes no sense and cannot possibly be a valid concern with my analysis. Moreover, in raising this absurd argument, Dr. Saravia reveals her results-oriented approach once again. She appears to be perfectly willing to cite to the effects of generic fipronil competition when she believes (wrongly) that they help her desired results, but elsewhere she waves off the same facts when I show (correctly and convincingly) that they support a conclusion contrary to her desired results. Dr. Saravia's approach is self-contradictory and unsound economic analysis selectively in search of her desired result.

73. In short, *all* of Dr. Saravia's arguments about so-called "confounding factors" are speculative, unwarranted, and meritless. The supposed issues were considered and addressed—in multiple cases they are affirmatively and explicitly controlled for in my analysis. Further, she fails to show how any of the things she raised would actually (let alone significantly) change the results or the conclusions that can be drawn. Ultimately, her long list of alleged issues are simply red herrings that unconvincingly and unwarrantedly seek to detract from and discredit my sound, straightforward analyses.

D. My Difference-in-Difference Regressions Follow Well-Accepted Economic Methods

74. As but one of multiple quantitative methods, I presented a difference-in-differences regression analysis in **Section IV.C.2.b** of my initial report. In that analysis, I conducted a statistical analysis that quantifies the degree to which the trend in sales of Bayer's Advantage/Advantix products diverged from the trend in sales for Frontline, using the entry of various products—namely, generic fipronil spot-ons—as exogenous "shocks" to the choice set of wholesale customers of flea and tick treatment products. These shocks created significant relative price differences—economically akin to price increases for incumbent products—and significantly increased competition in the industry for flea and tick treatment products in general. The regressions show that the non-imidacloprid shocks had no significant impact on Bayer's sales trend, whereas they caused significant declines in Frontline's sales trend.

75. In addition to what is discussed above about my empirical approach, Dr. Saravia attempts to discredit the regression specifically via a combination of mischaracterization of my analysis and excessively narrow interpretation of the economic literature. As I explain here, her

critiques are meritless and reflective of her misguided views on econometric/statistical methods. She also selectively misreads some of the results I presented in my regression tables (see **Exhibits 8A-8C** of my initial report). Overall, she claims that (a) my statistical analyses "are not difference-in-differences regressions,"[90] (b) I do not have "the data necessary for estimating a difference-in-differences regression,"[91] and (c) my regression results yield "nonsensical conclusion[s]"[92] or that I "mischaracteriz[e] [my own] regression results."[93] I address each of these critiques below and show that she is wrong on all counts.

76. First, Dr. Saravia's assertion that my analyses do not qualify as difference-in-differences seems to stem from a profound confusion on her part about basic econometric methods. She asserts an incorrect and arbitrarily narrow definition of the difference-in-differences econometric framework. In reality, difference-in-differences analysis is a general technique that encompasses a broad variety of possible empirical studies. The proper definition, as the name implies, includes an analysis involving two sources of differences that can be compared to estimate an economic parameter of interest.[94] There is a wide, varied breadth of possible difference-in-differences techniques, with different techniques utilizing different sources of differences and making different comparisons.

77. As one example, a cross-sectional difference-in-difference study might compare different pairs across a dataset at a single point in time to make a comparison or draw a conclusion. For example, one influential study examined the effect of employer-sponsored health insurance on job mobility to assess the strength of "job-lock" using cross-sectional data.[95] In that study, the author analyzed whether workers have employer-provided health insurance coverage (as the "first difference") and whether there was variation in their expected medical expenses (as

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[90] Saravia Report, ¶ 118.

[91] Saravia Report, ¶ 119.

[92] Saravia Report, ¶ 121.

[93] Saravia Report, ¶ 123.

[94] *See, e.g.*, Lechner (2011), pp. 165-224 at pp. 167-169 (The author notes that the general difference-in-differences (or "DiD") framework considers "the case of only two differences although the basic ideas of DiD estimation could be extended to more than two dimensions to create difference-in-difference-in-difference-in-…estimators. … The DiD design is usually based on comparing de facto four [2 × 2 = 4] different groups of objects." Moreover, DiD can be applied without considering the time dimension because "the concept of time is only used to define a group that is similar to the treated group with respect to relevant unobservable variables and whose members have not (yet) participated, any other characteristic may be used instead of time as well, as long as the formal conditions given [in the paper] are fulfilled.").

[95] Madrian, Brigitte C., "Employment-Based Health Insurance and Job Mobility: Is There Evidence of Job-Lock?", *The Quarterly Journal of Economics*, Vol. 109, No. 1, 1994, pp. 27-54.

the "second difference") to compute a difference-in-differences estimate. Despite not fitting the mold that Dr. Saravia describes, the study's author clearly and appropriately described her empirical strategy as following "a difference-in-difference approach" and her results as "difference-in-difference estimate[s]."[96] As another example, one study investigated the effect of insurance subsidy schemes on plan choice, using subsidy scheme (as the "first difference") and the individual's eligibility for subsidies (as the "second difference") to compare choices of insurance plans.[97] Yet another study examined racial discrimination among NBA referees, using the race (black or white) of the basketball player (as the "first difference") and the percentage of white referees in a game (as the "second difference") to compare the foul rates among players.[98] These studies do not fit the mold of what Dr. Saravia describes and yet they (and many others) are clearly a "difference-in-difference" empirical approach.

78. As a second example, an event-study difference-in-difference might track the effect of a policy change for two groups, one that was affected by the policy and one that was not.[99] For example, one might analyze how a government subsidy affects certain people. One could perform a difference-in-differences analysis comparing the difference in outcomes for each person before and after the date of the subsidy (as the "first difference") and how those differences across time vary for people that received the subsidy and people that did not (as the "second difference"). This technique looks at the two (or more) groups as the first difference and a difference in trends as the second difference in order to make a difference-in-differences comparison.[100] And even beyond these (non-exhaustive) archetypes, there are many other

[96] Madrian (1994), pp. 27-54 at p. 28 ("I estimate the extent of job-lock using a difference-in-difference approach: the mobility between those with high and low expected medical expenses should be greater for those with employer-provided health insurance than for those whose jobs do not include insurance."), and pp. 32, 42-49 ("difference-in- difference estimate" and "estimator").

[97] Kaufmann, Cornel, Schmid, Christian, and Boes, Stefan, "Health Insurance Subsidies and Deductible Choice: Evidence from Regional Variation in Subsidy Schemes," *Journal of Health Economics*, Vol. 55, 2017, pp. 262-73.

[98] Price, Joseph, and Wolfers, Justin, "Racial Discrimination among NBA Referees," *The Quarterly Journal of Economics*, Vol. 125, No. 4, 2010, pp. 1859-87.

[99] As discussed above in **Section V.B**, there are countless other variations of event-studies (often using a difference-in-differences framework) that look at other types of treatment/control and/or intensity of treatment. There is no requirement that stipulates an event study (or any other difference-in-difference) must have a completely untreated control group. Further, even the label of "control" is context dependent and is adjusted to the specific setting being analyzed.

[100] *See, e.g.*, Kangasharju, Aki, "Do Wage Subsidies Increase Employment in Subsidized Firms?" *Economica*, Vol. 74, No. 293, 2007, pp. 51-67; Havnes, Tarjei, and Mogstad, Magne, "No Child Left Behind: Subsidized Child Care and Children's Long-Run Outcomes," *American Economic Journal: Economic Policy*, Vol. 3, No. 2, 2011, pp. 97-129.

empirical designs that fall under the same framework, all of which would be difference-in-difference analyses.

79. Dr. Saravia seems to narrowly define difference-in-difference analysis to only encapsulate event-studies—i.e., the second of the two difference-in-difference examples above.[101] She appears to ignore the fact that "difference-in-differences" analyses are more general than strictly "event studies." To wit, Dr. Saravia proclaims that "Dr. Wong cannot draw conclusions about substitution between Advantage/Advantix and generic fipronil in an event study (or difference-in-differences) framework," seemingly implying that "event study" and "difference-in-differences" are interchangeable terms (they are not).[102] In fact, as the examples I cite to show, there is a wide variety of literature in economics that conducts studies involving difference-in-differences analysis. Many of the notable examples do not use Dr. Saravia's narrow conception of what is really a general econometric framework, let alone what appears to be her preferred regression specification. To name a few examples specifically studying economic questions related to pharmaceuticals, there are studies using various difference-in-differences specifications to examine how potential competition affects generic drug pricing,[103] strategic interactions between manufacturers of branded and generic drugs,[104] the effect of government policies on pharmaceutical prices and utilization,[105] and the impact of copay coupons on generic utilization.[106] These examples illustrate the flexible and wide applicability of the difference-in-differences framework. My regression analysis is most certainly a difference-in-differences analysis consistent with the multiple different approaches in the literature, and Dr. Saravia's arbitrarily narrow definition does not change that fact.

[101] In fact, her arbitrarily narrow limiting does not even apply to event-studies. There are many event studies that do not employ a difference-in-difference framework.

[102] Saravia Report, ¶ 117.

[103] Tenn, Steven, and Wendling, Brett W., "Entry Threats and Pricing in the Generic Drug Industry," *Review of Economics and Statistics*, Vol. 96, No. 2, 2014, pp. 214-228.

[104] Ellison, Glenn, and Fisher Ellison, Sara, "Strategic Entry Deterrence and the Behavior of Pharmaceutical Incumbents Prior to Patent Expiration," *American Economic Journal: Microeconomics*, Vol. 3, No. 1, 2011, pp. 1-36.

[105] Duggan, Mark, and Scott Morton, Fiona, "The Effect of Medicare Part D on Pharmaceutical Prices and Utilization," *American Economic Review*, Vol. 100, No.1, 2010, pp. 590-607.

[106] Dafny, Leemore, Ody, Christopher, and Schmitt, Matt, "When Discounts Raise Costs: The Effect of Copay Coupons on Generic Utilization," *American Economic Journal: Economic Policy*, Vol. 9, No. 2, 2017, pp. 91-123.

80. Second, Dr. Saravia grossly mischaracterizes my analysis in claiming that I do not have "the data necessary for estimating a difference-in-differences regression."[107] Again, that is simply not true—my analysis is a difference-in-differences analysis even if it does not adhere to the exact specification she would prefer. Further, it appears that her complaint simply boils down to the disputed 2010 data point discussed above. Because my original regressions used Bayer data from 2011 to 2020 (and not the 2010 data point), she asserts (wrongly) that my data are deficient and that I do not have data "before" generic fipronil entry.[108] As I addressed in **Section IV.B** above, the lone data point is neither necessary nor important for the results. I show essentially identical regression results after including the 2010 data point that Dr. Saravia suggests is a fatal omission. Clearly, I do (and did) have the "data necessary for estimating a difference-in-differences regression," and I show directly that her criticism has no merit or significant empirical effect on the analysis whatsoever.

81. Further, Dr. Saravia ignores (or fails to understand) that there are multiple before/after comparisons built into my regression design. That is, my analysis includes exactly what she claims (wrongly) I did not include. She asserts that "difference-in-differences regressions require data from before and after the event of interest for both treatment and control groups."[109] In fact, I do study before/after (a) generic fipronil entry, (b) Seresto entry, and (c) generic imidacloprid entry. All three of these shocks are accounted for in the regressions and the before/after results are plainly presented in the tables summarizing my analysis.[110]

82. Further still, my analysis includes a continuous explanatory variable that accounts for how each shock (and the competition it introduces) evolves over time. In that sense, each and every year is its own before/after comparison, and the regression presents the average of those many before/after comparisons. For example, as I explained above, my regression quantifies the accumulating annual effects of generic fipronil entry over time. The regression accounts for the fact that, e.g., the average effect on Frontline is -10% in 2011 (i.e., year 1 of competition with fipronil generics), -20% in 2012 (i.e., year 2 of competition), -30% in 2013 (i.e., year 3 of competition), and so forth. That year-over-year effect is identified because the regression

[107] Saravia Report, ¶ 119.

[108] *Id.*

[109] *Id.*

[110] Wong Report, **Exhibits 8A-8C**.

analysis compares before/after each successive year in a continuum of before/after comparisons. Again, Dr. Saravia ignores (or fails to understand) this aspect of my analysis, and she is wholly incorrect to assert that I do not do something that I, in fact, did do.

83. To be clear, incorporating continuous explanatory variables in difference-in-differences regressions is well-accepted and widely used in the economic literature. For example, drug trials routinely (if not predominantly) measure dosage levels continuously (e.g., 1 mg, 3 mg, etc.) rather than in binary terms (e.g., did/did not take dug). Moreover, as other examples, some of the studies from the labor economics field that Dr. Saravia herself cites use continuous explanatory variables, as I noted above in **Section V.B**. As still another well-known example, one study uses the continuous fraction of teenagers likely to be affected by a minimum wage (e.g., 5% versus 10%) in different states to proxy for the intensity of a policy change involving a federal minimum wage increase.[111] My regression specifications are analogous—I use the number of years since entry to account for the increasing intensity of the effects from competitor products.[112] Dr. Saravia ignores (or fails to understand) this aspect of my analysis, and her criticisms seem to suggest that she (wrongly) conceives of competition as only a binary on/off concept.

84. Third, Dr. Saravia's criticisms that my regression results are incorrect or nonsensical stem from her incorrectly interpreting my regression results. I address her errors in detail in **Section IV.B** above, including explaining clearly how to read my regression table and how she cites numbers out of their proper context. There are sound, credible results in my regression tables, and the results match both the economic theory and the plain facts (shown via straightforward methods) that I present above.

85. In sum, Dr. Saravia's bare assertions that "Dr. Wong's purported 'natural experiment' is fatally flawed" and that I did not conduct a "difference-in-differences regression" are grossly incorrect and misleading.[113] She makes ungrounded, misguided, and ultimately

[111] Card, David, "Using Regional Variation in Wages to Measure the Effects of the Federal Minimum Wage," *Industrial and Labor Relations Review*, No. 46, Vol. 1, 1992, pp. 22-37.

[112] For studies that consider time since generic entry and/or patent expiration as explanatory variables, *see, e.g.*, Frank, Richard G. and Salkever, David S., "Generic Entry and the Pricing of Pharmaceuticals," *Journal of Economics & Management Strategy*, Vol. 6, No. 1, 1997, pp. 75-90; Hollis, Aidan, "The Importance of Being First: Evidence from Canadian Generic Pharmaceuticals," *Health Economics*, Vol. 11, No. 8, 2002, pp. 723-34; and Reiffen, David and Ward, Michael R., "Generic Drug Industry Dynamics," *The Review of Economics and Statistics*, Vol. 87, No. 1, 2005, pp. 37-49.

[113] Saravia Report, ¶ 100 and 118.

incorrect criticisms that do not accord to the economic literature. In many cases, she ignores (or fails to understand) the data I actually used, the analysis I actually conducted, and the results I actually obtained. Instead, she resorts to mischaracterizations and cites to my results out of context. As I have clarified in this section, my difference-in-differences regressions are well grounded in the economic literature and they have been so from the start. Among many things, my regression analysis corresponds to the empirical framework employed in difference-in-differences studies that Dr. Saravia herself cites to.

VI. Real-World Data Confirms the Relevant Market is Appropriately Limited to Only Imidacloprid Spot-Ons

86. The disagreement in this case concerning relevant antitrust market definition primarily comes down to a debate about which evidence, among different types, is the most informative and suited to the antitrust and economic concepts. My analysis, as explained extensively in my initial report and here, focuses on real-world data (and the plain, undisputed facts that these data show) and an application of well-accepted antitrust and economic frameworks and concepts to those real-world data. In contrast to my well-supported, real-world analysis, Bayer's economics expert, Dr. Saravia, focuses on business documents containing subjective views on the "market" and "competition" (without supporting economic analysis), incorrect theory (focusing solely on consumers and ignoring wholesale customers), and speculative assertions that are contrary to what the real-world data show.

87. As I explained in my initial report and address again here, the real-world data show (a) Bayer was the only seller of imidacloprid spot-ons as of 2010 and 2011, (b) Bayer raised its prices for imidacloprid spot-ons from 2011 to 2016, (c) despite Bayer's price increase and increasing competition from fipronil spot-ons and other products, Bayer saw no significant loss in sales from 2010 and 2011 to 2016 (and likely increased its sales), and (d) over the same time period, there is clear evidence of substitution from Frontline (i.e., fipronil spot-ons) to generic fipronil spot-ons and other flea and tick products. It is my opinion that these facts show minimal (or zero) actual, real-world substitution from imidacloprid spot-ons to other products and that the hypothetical monopolist test ("HMT") is satisfied for a relevant market limited to only imidacloprid spot-ons. Despite these facts and the clear conclusions drawn from those facts, Dr. Saravia disagrees, focusing mainly on business documents that discuss "competition"

generally and/or purport to show consumer switching between flea and tick products.[114] She also makes incorrect assertions as to how she believes the HMT should be conducted.[115] In this section, I address the flaws with Dr. Saravia's criticisms and reiterate the reasons the real-world data support the opinions that I outlined in my initial report.

A. The Real-World History in this Case Shows that the Hypothetical Monopolist Test is Satisfied for a Relevant Market of Only Imidacloprid Spot-Ons

88. As discussed above in Section III, Bayer raised its prices for Advantage/Advantix by at least a SSNIP, both in absolute terms and relative to other flea and tick products. As explained in that section, Dr. Saravia's dispute is not whether that price increase occurred (it did) but rather whether it was large enough to be considered significant (it was). Multiple measures show that Bayer *did* institute a significant, sustained price increase consistent with commonly accepted definitions of a SSNIP. And the fact that Bayer did, in fact, implement a SSNIP has important implications for relevant market definition and the application of the HMT, as I explain in my initial report.[116] Dr. Saravia simply attempts to deflect these plain facts and conclusions, claiming (a) Bayer's "price changes [are not] a 'natural experiment'"[117] because "Bayer's pricing was the result of strategic decisions,"[118] and (b) "market conditions change[d]"[119] and "competitive conditions [were] not constant."[120] Under her conceptualization of the HMT, no real-world price increase could ever be used to empirically to examine the boundaries of a relevant antitrust market. She makes the conclusory (but unsupported) statement that the "HMT posits a SSNIP that holds all else constant, which is only credible at the moment of the test."[121]

89. In asserting that Bayer's real-world SSNIP cannot be used as part of the HMT, Dr. Saravia stakes out an extreme (and wrong) position that is contrary to accepted economics.

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[114] Saravia Report, § 5.1.

[115] Saravia Report, § 5.2.

[116] Wong Report, ¶¶ 84 and 87.

[117] Saravia Report, ¶ 96.

[118] Saravia Report, ¶ 98.

[119] Saravia Report, ¶ 103.

[120] Saravia Report, ¶ 104.

[121] *Id.*

There are ample examples of economic analysis relying on real-world price increases to test the HMT and define a relevant market, just as I have done in this case. As a prime example, one article provided "a study of 116 market definition decisions from the Federal Trade Commission's archives,"[122] explaining that one commonly used analysis involves real-world "[n]atural experiments, based on entry, strategic repositioning, or cost shocks [which] can also assist in market definition process."[123] The article proceeds to explain:

> The Merger Guidelines highlight four types of evidence that are particularly useful in applying the hypothetical monopolist construct for market definition. … **The first type of relevant evidence is information that suggests buyers have shifted or have considered shifting purchases between products in response to relative changes in price or other competitive variables. In effect, this evidence would reflect the results of a natural experiment in which something similar to a SSNIP has occurred in the past and buyers reacted** or the possibility of a SSNIP was evaluated and the buyers' considered responses. Examples could include actual responses to substantial market entry or exit, adjustment in purchases associated with some exogenous increase in the price of the goods in the proposed Guidelines market, or aggregate changes in market shares held by specific types of products linked to changes in competitive performance variables.[124]
>
> …
>
> For market definition purposes, natural experiments involve any substantial shock to the market equilibrium that generates clear implications for firms in the market and firms outside the market. **The analyst studies how firms react and uses this evidence to make inferences for market boundaries.** … Entry or exit events are probably the most common experiments to study, because entry and exit are readily identifiable. … Natural experiments could also be linked to major changes in competitive strategies on the part of a set of firms, as these actions effectively bring new competitive forces to the market (for example, a major expansion by an incumbent could have similar effects to entry).[125]
>
> …
>
> Obviously, if solid critical loss evidence or natural experiment information exists, these more robust techniques are used directly and the results of the weaker test are ignored.[126]

[122] Coate, Malcolm B., and Fischer, Jeffrey H., "A Practical Guide to the Hypothetical Monopolist Test for Market Definition," *Journal of Competition Law & Economics*, Vol. 4, No. 4, 2008, pp. 1031–1063 at 1031.

[123] Coate and Fischer (2008), pp. 1031-1063 at 1032.

[124] Coate and Fischer (2008), pp. 1031-1063 at 1038.

[125] Coate and Fischer (2008), pp. 1031-1063 at 1044-1045.

[126] Coate and Fischer (2008), pp. 1031-1063 at 1050.

In short, Dr. Saravia is incorrect to assert that an implementation of the HMT must incorporate only a hypothetical, instantaneous SSNIP. As the article quoted above notes, market definition analyses frequently look at real-world price changes and use those to inform the appropriate market definition. Consistent with that common economic analytical approach, I analyze the effects of Bayer's actual, real-world increase in price (i.e., Bayer's SSNIP).

90. Continuing her extreme (and wrong) position that my analysis of the HMT was incorrect, Dr. Saravia asserts that "changes in sales cannot be interpreted as evidence of substitution."[127] As the above quote makes clear, her assertion is simply contrary to reality and common practice—reliable economic analysis can (and does frequently) look at how "buyers reacted" when "something similar to a SSNIP has occurred in the past." That is precisely what I do. As is stated above in **Sections V.A and V.B**, I study the following history:

a) Until 2010, Bayer and Frontline were the sole sellers of imidacloprid and fipronil spot-ons, respectively;

b) The expiration of Frontline's patent allowed generic fipronil competitors to enter in 2011;

c) This 2011 entry "shock" precipitated Bayer's SSNIP over a subsequent six-year period in two ways:

   i) The shock itself caused a relatively instantaneous perceived increase in (relative) price for both Frontline and Bayer's Advantage/Advantix;

   ii) Subsequent to and on top of that shock, Bayer further increased the price of Advantage/Advantix, both in absolute and relative terms, by significant amounts.

In the context of those events and Bayer's SSNIP, I analyze the "reaction of buyers" to determine whether historical outcomes satisfied the HMT. That is, I look at changes in Bayer's and Frontlines' sales quantities to analyze (a) evidence of substitution (or lack thereof), and (b) whether competition from other non-imidacloprid products was sufficient to render Bayer's SSNIP unprofitable.

91. As I discuss in **Section IV**, the data show little to no substitution away from Bayer's Advantage/Advantix products to any non-imidacloprid spot-on product. And, despite increasing competition from multiple non-imidacloprid spot-on products, Bayer's SSNIP was

[127] Saravia Report, ¶ 103.

sustained and profitable. Most notably, the most reliable estimate shows that Bayer's sales grew by 7.5% from 2010 to 2016. Alternatively, using strictly data that is undisputed by Dr. Saravia from 2011 to 2016, Bayer's sales remained roughly constant, declining by less than 1% over the six-year period. There was no meaningful substitution away from Advantage/Advantix, as is confirmed by Bayer's growing and/or constant sales quantities over time. However, in the face of that plain fact, Dr. Saravia simply speculates that substitution did occur and that Bayer's SSNIP was constrained by substitution to other products. That is simply not true, and Dr. Saravia's claims are nothing but pure speculation.

92. First, Dr. Saravia claims my analysis "Relies on an Arbitrary Estimate of Bayer's Sales in 2010,"[128] claiming that the "2010 estimate[d quantity] drive[s my] finding that 'Bayer Successfully Retained (and Grew) its Sales Quantities Despite Its Higher Prices,' and that this finding is reversed by altering Dr. Wong's flawed estimation procedure."[129] This is a gross mischaracterization of the facts that I presented. The fact that Bayer's sales quantities did not change meaningfully is shown in multiple ways, including (a) the undisputed change from 2011 to 2016,[130] (b) the regression analysis discussed above in **Section IV.B**,[131] (c) a comparison to Frontline,[132] and (d) Bayer's growing profit and margins.[133] There are numerous ways to see that Bayer experienced little to no substitution away from its Advantage/Advantix products. The lack of meaningful substitution away from Advantage/Advantix to other products (and the implication of that fact for relevant market definition) is simply not dependent on one 2010 data point.

93. Second, Dr. Saravia claims that there has been substitution between Bayer's Advantage/Advantix and Frontline. She makes this assertion repeatedly with no actual factual support or analysis. For example, she claims without any basis that there is "relatively stronger substitution between branded fipronil and imidacloprid topicals" (i.e., between Frontline and

[128] Saravia Report, § 5.2.2.2.

[129] Saravia Report, ¶ 115.

[130] **Exhibit 4**.

[131] **Exhibit 5**. As I explain in **Section IV.B**, the regression analysis shows, in fact, the results are not dependent on the 2010 data point.

[132] **Exhibits 4 and 5**.

[133] Wong Report, **Exhibit 10**; *infra*, **Exhibit 6**.

Advantage/Advantix).[134] In another part of her report, she asserts that the comparison between Bayer and Frontline (and Frontline's significant decline in sales over time) only speaks to "the question of whether the entry of fipronil generics impacted Frontline's sales more than Advantage/Advantix's sales. … This does not mean that fipronil generics do not compete with Advantage/Advantix, and it certainly does not mean that Frontline does not compete with Advantage/Advantix."[135] The historical real-world data shows directly that both statements are simply not correct. There is no evidence of any meaningful substitution between Advantage/Advantix and Frontline at any point in time for the period covered by the real-world data from 2010 to 2020.

94. [redacted]

95. There are still other examples of the lack of meaningful substitution between Bayer's Advantage/Advantix and Frontline. As one example, similar to Dr. Saravia's example

[134] Saravia Report, ¶ 129.

[135] Saravia Report, ¶¶ 122 and 124.

[136] Saravia Report, ¶ 112. Dr. Saravia also presents a Bayer document that purports to show "substitution across forms" from Advantage/Advantix and Frontline to Seresto and orals from 2013 to 2016 (Saravia Report, ¶ 83 and Exhibit 8). However, her argument falls short for several reasons. First, Bayer's actual real-world sales data present a far more credible view as to what substitution did or did not occur. Second, this document shows a decline in the so-called "share" industry-wide, likely due to incremental expansions in the overall industry. Bayer's Advantage/Advantix, in fact, saw no meaningful change in its own sales, but as a fraction of the overall industry (which is what the cited document shows), the so-called "share" for Bayer's Advantix falls. This does not show substitution from Bayer to other products—it simply shows that Seresto and oral products attracted new consumers to the industry overall.

[137] Saravia Report, Exhibit 13.

[redacted]

96. Third, Dr. Saravia asserts that once one has "concluded that branded and generic imidacloprid topicals are in the same market, the next step that the HMT requires [one] to take is to consider the next closest substitute, Frontline. The substitution between Frontline and Advantage/Advantix is never addressed by Dr. Wong in his statistical analysis."[139] This is not a correct characterization of the HMT or of my analysis whatsoever. My analysis of the HMT considered substitution from 2010 and 2011 to 2016, which is the period before generic imidacloprid spot-ons had entered the market. I showed that there was little to no substitution away from Bayer's Advantage/Advantix to *any* other products, including Frontline, generic fipronil spot-ons, and other products, such as Seresto and oral treatments. That lack of substitution confirms the HMT and the fact that all those other products—again, including Frontline—should be excluded from the relevant market. Contrary to Dr. Saravia's claims, this did address "substitution between Frontline and Advantage/Advantix" and does not require an analysis of other candidate markets (since the HMT was satisfied).

97. In sum, the analysis in my initial report presented a clear basis for defining a relevant market of only imidacloprid spot-ons. Real-world data show that (a) Bayer was the only seller of imidacloprid spot-ons before 2016, (b) Bayer implemented a SSNIP from 2011 to 2016, and (c) that SSNIP by Bayer was profitable and was not constrained by any other available flea and tick products at the time, including Frontline and generic fipronil spot-ons. Those three facts satisfy the HMT and the entire analytic approach is consistent with well-accepted economic analyses. Dr. Saravia's response to my analysis is speculative and contrary to reasonable

[138] Dr. Saravia claims the years after 2016 show a "shift from topicals to orals and collars" (Saravia Report, ¶ 93 and Exhibits 9 and 10). That is beside the point, as my primary analysis of the relevant market and Bayer's historical monopoly power focuses on 2011 to 2016, showing the competitive realities both historically and at the time Bayer instituted its anticompetitive conduct.

[139] Saravia Report, ¶ 124.

economics. She expresses extreme views on how the HMT should be run and she makes assertions that are contradicted by plain evidence.

B. Dr. Saravia's Extensive Focus Only on Consumer Switching is Inappropriate

98. Dr. Saravia's analysis of market definition focuses extensively on whether individual consumers could or do occasionally switch between flea and tick treatments. Her recurring references to consumer switching (and corresponding lack of discussion of wholesale customer switching) show that she ignores (or does not understand) the important economic theory and market realities at work in this case. Furthermore, she mischaracterizes my discussion of wholesale and consumer demand, asserting (wrongly) that I claim that "consumer switching is un- or less important." Her un-careful reading of the economics that I actually present shows her results-oriented approach and her desire for substitution between different flea and tick products to be as she prefers, not as it actually is as a matter of fact.

99. First, to be clear, contrary to Dr. Saravia's claims, I stated quite clearly that consumer demand for flea and tick products *affects* wholesale customer demand, but wholesale customer demand (i.e., the sales that Bayer and Tevra actually make) is a distinct concept.[140] This is not a question of economic methods or opinion—this is a matter of fact. Wholesale customers are different entities from consumers—they make distinct purchase decisions and transact with different parties. Pointing out this fact and explaining how and why this is important as an economic matter is *not* a claim that consumers are "un- or less important." Moreover, it is Dr. Saravia's inability (or unwillingness) to address this distinction that is the actual fatal flaw—her analysis of only consumer switching does not address the actual claims and economic issues of this case.

100. To clarify once again what I said in my initial report, consumer demand and switching can affect wholesale customers and their own demand, but it is the net substitution by consumers that matters to a wholesale customer (i.e., a retailer or distributor). And it is the net substitution by wholesale customers that impacts a manufacturer's sales. An analysis of the parties in this case—Tevra and Bayer, which are both manufacturers—and the alleged conduct—exclusive dealing between a manufacturer and wholesale customers—should analyze the

[140] Wong Report, ¶¶ 55-58.

ultimate impact to manufacturers' sales. An analysis of consumer purchases must be accompanied by an analysis of how those consumer purchases impact behavior upstream through the supply chain and ultimately affect manufacturer sales. Dr. Saravia fails to do this thorough analysis and address the actual relevant margin of substitution is fatal—without a comprehensive analysis she cannot properly analyze substitution relevant to market definition and she cannot properly assess Bayer's alleged conduct. In short, her opinions are built on a short-cut analysis that looks only at the first of multiple steps and is, thus, an unsound, unreliable economic analysis.

101. A simple but illustrative example can show the distinction between individual consumer switching and the ultimate impacts to manufacturers—again, the demand manufacturers actually face is distinct. Suppose 100 consumers visit a retailer (i.e., a wholesale customer) and each buys 1 unit, with 50 consumers purchasing Product A and another 50 purchasing Product B. Suppose further that sometime later those same 100 consumers come back to the retailer, but 25 of the 50 consumers switch from Product A to Product B, and 24 of 50 consumers switch from Product B to Product A. Thus, in that example, there is ample "switching" by consumers (nearly half "switched"), but that isolated fact is misleading and does not address the relevant questions for this case concerning demand at the wholesale level. In fact, that switching of 25 and 24 consumers, respectively, is only a net substitution of 1 consumer—demand was split 50/50 before, and demand was split 51/49 after. From the retailer's perspective, there is a minimal amount of net substitution, as it faces nearly the same aggregate consumer demand both before and after the so-called "consumer switching" that Dr. Saravia fixates on. Moreover, because the retailer faces essentially the same net demand from consumers, it will, in turn, purchase essentially the same products and the same amounts at the wholesale level. Before, the retailer buys 50 units of each product in the upstream wholesale market, and after, the retailer buys 51 and 49 units, respectively. From the manufacturers' perspectives, there is equivalently minimal substitution—the manufacturer of Product A sees only 1 unit of substitution (50 to 51 units), and the manufacturer of Product B sees only 1 unit of substitution (50 to 49 units). Further still, were one to continue the example across many retailers (i.e., many wholesale customers) the analogous concept would apply. If there are ten retailers, with half seeing net substitution of 1 unit toward Product A and the other half seeing net substitution toward Product B, the net effect is a wash. But that net effect across many wholesale customers

(i.e., the whole of manufacturers' demand, i.e., the whole of the market) is what matters for the economic analysis of this case.

102. As the example illustrates, it is possible for any individual consumer to switch flea and tick products, and it is possible for many consumers to have shuffled between different flea and tick products over time, but neither fact addresses the actual measure of substitution that is relevant. The parties and relevant market in this case is the *wholesale* market for imidacloprid spot-ons. Whether some consumers could have switched between flea and tick products does not address whether they would have (or did) switch *in-net* in sufficient magnitudes to affect retailers' own demand for those same products at the wholesale level. Nor does simply pointing out that some consumers might have switched without any net quantification address whether retailers' own demand for flea and tick products at the wholesale level, in turn, changed *in-net* in sufficient magnitudes to meaningfully impact manufacturers' sales of those products. There are at least two additional steps that must be analyzed and that Dr. Saravia simply ignores when she discusses consumer switching in the abstract.[141]

103. The economic literature, particularly that concerning market definition, focuses on net substitution for the parties in question. As the prime example, the Horizontal Merger Guidelines discusses the HMT exclusively in terms of *net* effects to the suppliers in a given candidate market. Consider these specific examples of the HMT that are discussed:

a) "Example 5: Products A and B are being tested as a candidate market. … Product A **loses twenty units** of sales to products outside the candidate market;"[142]
b) "Example 6: In Example 5, suppose that half of the **unit sales lost** by Product A …;"[143]
c) "Example 19: In Example 5, the merged entity controlling Products A and B would raise prices ten percent, given the product offerings and prices of other firms. In that example, one-third of the **sales lost by Product A** when its price alone is raised are diverted to Product B;"[144]

[141] To be clear, Dr. Saravia does not even quantify the net consumer switching as a first step. She only observes that consumers could switch, which is a vacuous point without additional analysis.

[142] Horizontal Merger Guidelines, § 4.1.1 (emphasis added).

[143] *Id.*

[144] Horizontal Merger Guidelines, § 6.1 (emphasis added).

d) "In considering customers' likely responses to higher prices, the Agencies take into account any reasonably available and reliable evidence, including, but not limited to: [first,] **how customers have shifted purchases in the past** in response to relative changes in price or other terms and conditions;"[145]

e) "Agencies also may consider a 'critical loss analysis'… The 'critical loss' is defined as the number of lost unit sales that would leave profits unchanged. The "predicted loss" is defined as the number of **unit sales that the hypothetical monopolist is predicted to lose** due to the price increase. The price increase raises the hypothetical monopolist's profits if the predicted loss is less than the critical loss."[146]

As those quotes indicate that the appropriate economic approach to market definition and the HMT considers whether and how much net sales are lost by the hypothetical monopolist. That is exactly what I have done in my analysis by studying whether and how much net sales quantities were actually lost by Bayer.

104. [redacted].

[145] Horizontal Merger Guidelines, § 4.1.3 (emphasis added).

[146] *Id.*

[147] Saravia Report, ¶¶ 72-74 (emphasis added).

Saravia to focus on hypotheticals about substitution when historical, real-world facts show what substitution actually occurred.

C. Relevant Antitrust Market Definition Is A Distinct Concept Separate and Apart from Vernacular Usage of "Competition" and "Markets"

105. Dr. Saravia cites repeatedly to documents that "discuss 'competition' between imidacloprid and fipronil topicals or use other language indicating competition within this group of products,"[148] and to documents that "pool topical medications together when discussing market shares or describing the market, regardless of the active ingredient."[149] Her presentation of these documents is misleading and it does not accord to well-accepted principles of antitrust market definition. Here too, again, the *Horizontal Merger Guidelines* are instructive and show her error: "Relevant antitrust markets defined according to the hypothetical monopolist test are not always intuitive and may not align with how industry members use the term 'market.'"[150]

106. It is true that flea and tick products compete generally in the broad, vernacular sense of the term "competition." These products are in the same industry, and they mostly serve the same general purpose (i.e., they attempt to treat fleas and/or ticks on pets). Consumers and wholesale customers can and do switch between these many different products industry-wide, such as the shift from Frontline to both generic fipronil spot-ons and to other flea and tick treatments from 2010 to 2016. But the existence of competition generally is not sufficient to show the boundaries of an antitrust relevant market or quantify the degree of substitution and competition between different products. For example, it is true that cars and motorcycles "compete" with on another generally—both are wheeled vehicles that consumers might buy and use for personal transportation, and surely some customers, somewhere have substituted between the two. But the existence of that general "competition" between cars and motorcycles does not speak to the actual degree of substitution between them, and it does not mean they belong in the same relevant market.[151]

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[148] Saravia Report, ¶ 63.

[149] *Id.*

[150] Horizontal Merger Guidelines, § 4.

[151] Horizontal Merger Guidelines, Examples 4 and 7 ("In Example 4, including cars in the market will lead to misleadingly small market shares for motorcycle producers. Unless motorcycles fail the hypothetical monopolist test, the Agencies would not include cars in the market in analyzing this motorcycle merger.").

107. Relevant antitrust market definition addresses a much more specific and pointed question than whether flea and tick treatments all "compete" with one another generally or whether some person, somewhere has used the terms "industry" and "market" interchangeably. Relevant antitrust market definition is about identifying a product (or geography) at issue and, in turn, identifying the set of products that have a sufficient competitive constraint on that product at issue. My analysis did just that—starting with the product that the parties to this case sell (imidacloprid spot-ons), I analyzed the extent to which all other products posed a sufficient competitive constraint (they did not). Frontline and generic fipronil spot-ons are excluded from the relevant market because they did not (in the real-world) provide a sufficient competitive constraint on the sale of imidacloprid spot-ons from at least 2011 to 2016. Likewise, other products, like Seresto flea collars, also did not provide a sufficient competitive constraint on the sale of imidacloprid spot-ons from at least 2011 to 2016. It does not matter that some industry executives subjectively referred to Frontline and other products as "competing" or in the "market" with imidacloprid spot-ons—historical data show that the general "competition" that these other products offered was not of sufficient magnitude according to well-accepted antitrust principles.

108. Once again, the appropriate analysis should focus on what historically transpired with regard to substitution. The question of whether a consumer could hypothetically substitute (or might substitute in the future) does not address the fact that they did not do so for at least a six-year period within the timeframe that is a focus of this case. The actual historical facts are what show the appropriate relevant market definition, as is addressed in my analysis and discussion of the relevant market in this case.

D. Documents Cited By Dr. Saravia Are Inherently Flawed and Incomplete

109. Setting aside the (at best) tangential value of Dr. Saravia's numerous cited documents discussing "competition" and "markets" in the vernacular sense, it is also the case that those same documents she cites contain fatal flaws. These flaws at best minimize their informativeness to the question of market definition, and perhaps more likely show misleading assertions that are inconsistent with the real-world historical data that I analyze.

110. First, the documents that Dr. Saravia cites concerning switching between products focus on individual consumer switching, and neither the documents themselves nor Dr. Saravia

[redacted]

[152] Saravia Report, ¶ 72.

[153] Saravia Report, ¶ 65.

[154] Saravia Report, ¶ 76.

[155] Saravia Report, ¶ 81.

[redacted][159]

112. Moreover, it cannot be that surveys with limited choices and other hypotheticals (e.g., hypothetical prices) are more accurate than real-world, historical data. Rather than ask customers what they might do in a contrived situation, one has the ability in this case to study what consumers and, in turn, wholesale customers actually did, facing actual choices and actual prices, and spending actual money. Presenting a few incomplete hypotheticals from surveys—particularly, surveys focused on brand-to-brand comparisons and not on generic products—cannot possibly be a reliable, complete form of evidence that is more credible than actual, real-world sales data.

VII. Real-World Data Provides Direct Evidence that Bayer Held Monopoly Power

113. The real-world facts that show imidacloprid spot-ons constituting their own relevant market also show that Bayer held and exercised monopoly power. That is, one can utilize the fact that Bayer instituted a SSNIP before 2016 to draw two conclusions. First, because this SSNIP was applied to essentially all the imidacloprid spot-ons (i.e., the entire candidate market) and was successful despite growing availability and lower prices from other products, one can conclude that the relevant market is appropriately limited to imidacloprid spot-ons. Second, because Bayer (i.e., a single company) was able implement this market-wide SSNIP, maintain its market position despite that SSNIP, and there were no entrants (or existing competitors) that were able to defeat that SSNIP for a sustained period of time, one can conclude that Bayer held and exercised monopoly power until at least 2016. It this direct evidence of

[156] Saravia Report, ¶ 72.

[157] BAH000257273 at pp. 53-55.

[158] Saravia Report, n. 182.

[159] BAH000088575 at p. 20.

monopoly power, exercised over a sustained period of time, that informs my opinion that Bayer held monopoly power at the point its alleged conduct began.

114. As with many other instances, Dr. Saravia grossly mischaracterizes my opinions and analyses concerning monopoly power. She says that my opinion that Bayer held monopoly power until 2016 "relies heavily on [my] flawed market definition, which, by construction, generates high market shares for Bayer."[160] This is not what my opinion states and she does not accurately describe the evidence I present. Furthermore, Dr. Saravia asserts (wrongly) that the "history of entry of new competing products shows that barriers to entry are surmountable."[161] The fact is that entry into the properly defined relevant market did not occur until 2016, and even after that point, expansion of those competitors has been constrained by Bayer's anticompetitive conduct. There were, in fact, significant barriers to entry that are important to this case and they help show why and how Bayer was able to hold and exercise monopoly power.

A. Bayer's Market Position Was Protected by Clear Barriers to Entry Until 2016

115. It is undisputed that Bayer was essentially the only seller of imidacloprid spot-ons until 2016.[162] It follows from this fact that Bayer held at or near 100% market share in a relevant market of only imidacloprid spot-ons. However, the simplicity of the ultimate market share calculation does not negate the extensive analysis of competition that built up to that conclusion. The relevant market definition and the resulting market share calculation both arise *because* an extensive analysis of real-world data showed other non-imidacloprid products and firms are not sufficiently close competitors to imidacloprid spot-ons, as I discussed above. It is misleading and incomplete for Dr. Saravia to say flatly that the 100% market share for Bayer "relies heavily on [the] market definition" without acknowledging the evidence and analysis that underlie that result. Stated more properly and completely, both the appropriate relevant market definition and the resulting market shares rely on the real-world evidence showing there were not significant competitors to Bayer's imidacloprid spot-ons from 2010 to 2016, including no competitor imidacloprid spot-ons and no significant competitors among multiple other non-imidacloprid flea and tick treatments. My opinions in this case are based on my extensive analysis of the extent of

[160] Saravia Report, ¶ 140.

[161] *Id.*

[162] Saravia Report, ¶ 28.

competition faced by the product at issue (imidacloprid spot-ons) and the primary seller of that product (Bayer). It is wrong for Dr. Saravia to conflate conclusions (relevant market definition) with the actual economic evidence that supports those conclusions (the lack of historical substitution away from Advantage/Advantix).

116. Furthermore, the static fact of Bayer's at or near 100% market share is not by itself the basis for concluding that Bayer held and exercised monopoly power. As I explained clearly in my initial report, one can conclude that Bayer held monopoly power both (a) because it held high market share *and*, perhaps more importantly, (b) the nature of how that market share was maintained over an extended period of time.[163] Here, as well, those are facts that derive from an extensive analysis of competitive conditions over time and of real-world data showing that Bayer did, in fact, maintain its sales and market position in spite of its own price increases and in spite of increasing competition generally. The key point is not solely the level of Bayer's market share at a particular point—it is also the fact that Bayer's market share was sustained and entry and competition did not diminish it historically.

117. Bayer was able to sustain its market position because there were significant barriers to entry specifically for the relevant market for imidacloprid spot-ons. That is, undisputed facts show that barriers to entry did exist for specifically competitor imidacloprid spot-on products up to 2016. Before that point, Bayer held an exclusive EPA registration and patents for its Advantage/Advantix products.[164] Those government-sanctioned barriers made it practically impossible for a competitor imidacloprid spot-on product to enter, and it is an undisputed fact that no competitor did enter.[165] Dr. Saravia speculates that "large firms could [have] launch[ed] imidacloprid products,"[166] but this is an unfounded assertion and an irrelevant hypothetical—again, the undisputed history shows that no firm did enter before 2016.

118. It is true that firms could have and did enter the *industry generally* by introducing other non-imidacloprid products that are not part of the relevant market in this case. Much of the discussion above concerning market definition covers this fact—although multiple other products entered the industry, including multiple generic fipronil spot-ons, Seresto flea collars,

[163] Wong Report, ¶ 103.

[164] Wong Report, ¶ 38; Saravia Report, n. 47.

[165] Wong Report**, Exhibit 3A**; Saravia Report, ¶ 28.

[166] Saravia Report, ¶ 155.

and oral treatments, none of these other products separately or jointly managed to competitively constrain the pricing and sales of Advantage/Advantix before 2016. Dr. Saravia accurately points out that these other non-imidacloprid products entered, but she is wrong by asserting that these other-product entry events show "whatever barriers to entry may exist can be surmounted." The entry of other non-imidacloprid products may show that entry into the industry, in general, is possible, but the fact that these other products successfully entered while imidacloprid spot-on products did not is what shows that there are barriers to entry specifically for the relevant market in this case.

119. It is also true that the main barriers to entry to the relevant market for imidacloprid spot-ons were removed in 2016 once Bayer's patents and EPA exclusivity expired. Indeed, the data show that (a) multiple firms entered after that point, and (b) Bayer's only declines in sales across the entire decade of study in this case occur specifically after imidacloprid spot-ons were able to enter. Those facts show both the strength of the entry barriers that did exist—i.e., they were holding back multiple firms—and the importance of removing those entry barriers—i.e., the competition that was held back is the one and only type with any evidence of successfully constraining Bayer.

120. Dr. Saravia mischaracterizes my discussion of barriers to entry when she says that my discussion is "circular" and that I claim the "primary" barriers to entry are Bayer's monopoly power and Bayer's exclusive contracts.[167] As I explained in my initial report and re-explain here, the main barriers to entry were Bayer's government-sanctioned barriers (patents, EPA exclusivity) up to 2016.[168] Those barriers facilitated Bayer's monopoly power up to 2016, since the only type of competitor with a proven track record of competitively disciplining Bayer (generic imidacloprid spot-ons) was unable to enter. *After 2016*, I agree that those main barriers were removed, and it is my opinion that Bayer attempted to create a new barrier to entry in the form of its anticompetitive contracts, as I explain in **Section VIII**. Although generic

[167] Saravia Report, ¶ 153. In characterizing monopoly power as a barrier to entry, Dr. Saravia seems to confuse cause and effect. Barriers to entry can allow a firm to exercise monopoly power while blocking the competitive response. Barriers to entry are the cause, and monopoly power is the effect, not the other way around.

[168] Wong Report, ¶ 102 ("There are clear barriers to entry, as I discuss in **Sections III.A.3** and **IV.B**, including large regulatory barriers and intellectual property protections. In the relative market for imidacloprid spot-ons, those barriers—namely Bayer's EPA exclusivity and patents—were essentially absolute, as no other product successfully entered until 2016.").

imidacloprid spot-ons did enter after 2016, they struggled to expand because Bayer's exclusive contracts blocked them from accessing a significant share of downstream consumers.[169]

B. There Is Direct Evidence that Bayer Held and Exercised Monopoly Power Until 2016

121. As discussed above in **Section III**, the data show clear evidence that Bayer raised its prices by a significant amount. Bayer's ability to raise its prices without losing significant sales is direct evidence consistent with the very definition of monopoly power. Dr. Saravia does not directly address this question. In one part of her report, she disputes the magnitude of the price increase (*see* **Section III**) and whether the price increase satisfies the HMT (*see* **Section VI.A**), but she does not actually disprove these real-world facts (nor can she) that show Bayer directly held and exercised monopoly power. In another part of her report, she states that "changes in market conditions" caused Bayer to raise its prices, simply because Bayer was making "profit-maximizing decisions to reflect the new conditions."[170] Again, that does not actually disprove the real-world facts—her claims simply attempt to recharacterize Bayer's exercise of monopoly power as "profit-maximizing decisions" and pass the blame onto "changes in market conditions" rather than to address the fact that Bayer's own unilateral decisions determine its products' prices. The fact is that Bayer chose to raise its prices, both in absolute and relative terms, despite increasing competition in the industry.

122. As I also note above in **Section III**, when generic competitors enter, they reset the competitive price to a much lower level. Generic fipronil competitors entered in 2011 at likely around 35% discount (or more) to Advantage/Advantix and Frontline; generic imidacloprid competitors entered in 2016 at around a 39% discount (or more) to Advantage/Advantix and Frontline.[171] Even after the generic competitors entered in both instances, Advantage/Advantix and Frontline maintained or increased their prices.[172] What distinguishes Advantage/Advantix and Frontline is that Advantage/Advantix benefited from additional barriers to entry until 2016

[169] To be clear, the economic literature uses the term "barrier to entry" to refer to barriers to entry and expansion. An entry barrier might prevent a small firm that has entered (but not yet grown) from expanding. Bayer's conduct was a barrier to entry for new entering firms and a barrier to expansion for those that had entered but not yet grown.

[170] Saravia Report, ¶ 103.

[171] **Exhibits 3A-3B.**

[172] *Id.*

(patents) and then anticompetitive conduct after 2016. This means that, despite similar pricing behavior, Frontline lost significant sales to competitor products, whereas Bayer did not.

123. In response to these facts, Dr. Saravia simply states that it is "expected" for branded products to price higher than generic equivalents.[173] Whether or not that is true at the outset of generic entry, that assertion is not correct for a branded product's decision to maintain or grow its price over time after generic entry. Standard economic theory *expects* a firm to lower its price if a cheaper, substitutable product is introduced.[174] Further, the supposed justifications for those higher prices ("perceive[d] higher quality" and "advertising [to] support demand")[175] cannot explain Bayer's high and growing profit margins.[176] Again standard economic theory expects competition—particularly from a cheaper, equivalent product—should cause a firm to lower its prices and earn less profits.[177] Bayer's behavior in this case (raising prices and not significantly losing sales quantity) is, in fact, opposite from what economists expect a competitive firm to do.

124. Relatedly, Dr. Saravia criticizes the profit margin data that I present in my initial report. She claims that the profit margins are "wrong" because they include "farm animal products" and "Seresto."[178] She does not actually show that the conclusions I highlight are wrong. She presents no evidence or analysis to refute the fact that (a) Bayer increased its profits over time and (b) Bayer's profit margins were significantly higher than Tevra's. Nonetheless, setting aside Dr. Saravia's own complete failure to support her assertion, it is straightforward to show that Bayer's other margin data, specifically that for its Companion Animal Division and that found within its transaction data, show Advantage/Advantix had higher profit margins than the company as a whole.[179] **Exhibit 6** shows these additional profit margins. Had Bayer produced more comprehensive profit and margin data for specifically Advantage/Advantix, all

[173] Saravia Report, ¶ 148.

[174] Baye, Michael R., and Kovenock, Dan, "Bertrand Competition", *The New Palgrave Dictionary of Economics*, 2nd ed., Palgrave Macmillan, 2008, pp. 6-7 (see the "Product Differentiation" discussion, explaining that firms' pricing decisions are "strategic complements"); Pindyck and Rubinfeld (2017), pp. 445-446.

[175] Saravia Report, ¶ 148.

[176] Wong Report, ¶¶ 85 and 105.

[177] Baye and Kovenock (2008), pp. 6-7; Pindyck and Rubinfeld (2017), pp. 445-446.

[178] Saravia Report, ¶ 149.

[179] In my initial report, I focused on Bayer's company-wide margins because those data cover the longest time period with constant measures from the data. As I show here, it does not matter for the end conclusions that Advantage/Advantix are merely a large fraction (rather than literally all) of the sales and profits for Bayer as a whole.

the available data suggest these data would show even higher margins that I have conservatively calculated here and that I presented in my initial report.

VIII. Bayer's Anticompetitive Conduct

125. Bayer's economics expert, Dr. Saravia, mischaracterizes the economic theory of harm and the manner in which Bayer harmed competition as it is discussed in my initial report. Her inapt discussion, in turn, leads her to make flawed, incorrect, and misleading claims about (a) the purpose of Bayer's conduct and (b) the effect Bayer's conduct had on competition. Dr. Saravia attempts to summarize the issue by stating, "Tevra alleges that Bayer's actions prevented it from accessing the retailers and distributors that it needed to reach its potential customers and thereby caused its imidacloprid products to fail."[180] She claims (wrongly) that my analysis of Bayer's conduct (a) has a "singular focus on Tevra"[181] and ignores other "distribution" and "numerous retailers" that were not subject to Bayer's exclusive contracts,[182] (b) ignores the purported role of the exclusive contracts in preventing so-called "free-riding" by generics,[183] and (c) ultimately amounts to an analysis of "less than 30% of the sales of topical flea and tick medications" once one adds in non-imidacloprid sales.[184] In actuality, my analysis shows (a) the fact that competition from all generic imidacloprid competitors was foreclosed from a significant amount of the economy (and a large share of the properly defined relevant market) and (b) Dr. Saravia's claims that excluding generic competition as purportedly "procompetitive" are unsupported and incorrect. In this section, I reiterate what my analysis did show in my initial report and I address Dr. Savaria's flawed, unsound assertions attempting to rationalize Bayer's anticompetitive conduct.

[180] Saravia Report, ¶ 156.

[181] Saravia Report, ¶ 159.

[182] *Id.*

[183] Saravia Report, ¶ 160.

[184] Saravia Report, ¶ 161.

A. Bayer's Contracts Are a Barrier that Prevents Generic Competitors from Reaching Downstream Consumers

126. The theory of harm that explains Bayer's conduct is clearly outlined in my initial report.[185] It is not a theory about generic imidacloprid spot-ons "failing"[186] as a functional product, nor is it about generic imidacloprid manufacturers being unable to attain scale to efficiently produce their products.[187] Rather, this case is about Bayer's acts to foreclose access to specific wholesale customers, who in turn serve as key access points to very substantial numbers of end consumers. Generic imidacloprid spot-on manufacturers, like Tevra, are able to efficiently produce as much or as little product as they need.[188] Instead, their challenge is having sufficient supply-chain distribution channels to access consumers. Bayer's anticompetitive conduct restricted access to a significant amount (in share and in dollars) of distribution channels.

127. That is, when a generic manufacturer is unable to sell to a particular wholesale customer, that wholesale customer will, in turn, not offer the generic product downstream, preventing the product from accessing consumers.[189] The effect is akin to building a dam across a stream—the upstream barrier ensures that further downstream the water is shut off. The exclusive contract acts as the dam (i.e., the barrier), preventing the generic product from traveling the rest of the way downstream to end consumers. This is a harm to competition in two ways. First, upstream manufacturers, like Bayer and Tevra, are competing to sell to various wholesale customers (i.e., sell into particular distribution channels). If competition is unrestrained, each manufacturer attempts to offer better terms of sale and convince each wholesale customer to purchase more of its product, leading to (a) greater availability and distribution of the cheaper products (versus a scenario with only one manufacturer) and (b) lower wholesale prices from all manufacturers over time, as each competitor tries to outdo the other. If

[185] *See* Wong Report, **Section III.C** and **VI.A**. Dr. Saravia falsely states, "Dr. Wong does not articulate the theory of foreclosure." (Saravia Report, ¶ 180). That is simply not true. There are multiple instances in her report in which Dr. Saravia states I did not do something when I clearly did. This is one such example. Her statement is incorrect and reflects her results-oriented approach—she appears to prefer mischaracterizing my report rather than addressing the actual substance.

[186] Saravia Report, ¶ 156.

[187] Saravia Report, ¶ 197 and n. 410.

[188] Richmond Report, ¶¶ 18 and 21 (Tevra uses contract manufacturers to produce its products).

[189] If the wholesale customer is a distributor, the same logic applies but with one more link in the chain. The exclusive distributor does not offer the generic product downstream to its retailers, and those retailers, in turn, do not offer the generic product downstream to consumers. By shutting off a particular distribution path, the exclusive contract ensures that the generic product does not ultimately make its way downstream to consumers.

that competition is foreclosed and the branded (i.e., more expensive) manufacturer is the exclusive seller, there is (a) a direct effect of whereby the supply of the cheaper product no longer occurs (causing downstream consumers to pay more) and (b) a dynamic effect whereby the ongoing downward pricing pressure from manufacturers trying to outbid one another no longer occurs. Second, the downstream effect from that barrier upstream, and the retail competition that occurs "on the shelf" in front of each consumer is lost. If competition is unrestrained, a given consumer is presented with two choices, and the two products compete on the merits (e.g., better price, better packaging, etc.) for that particular consumer's purchase decision. If the upstream barrier blocks either product, that "on the shelf" competition is lost. Again, there is (a) a direct effect since the consumer's alternative choice (possibly a much cheaper version) is no longer available and the consumer pays more than otherwise would be the case, and (b) a dynamic effect whereby ongoing efforts to win over the consumer are lost.

128. In this case, Bayer's exclusive contracts were anticompetitive because they functioned as a barrier to certain, significant wholesale customers and, thus, prevented generic imidacloprid spot-ons from reaching many downstream consumers. In response to this theory, Dr. Saravia asserts that it is not anticompetitive because it did not "preven[t] the rivals from reaching a minimum efficient scale."[190] She also claims that exclusive contracts are only anticompetitive if they "completely foreclose rivals from a market" or "raise the rivals' costs" of production.[191] These claims are incorrect, inappropriate, and refer to theories that are not applicable to this case—Dr. Saravia is referring other cases of foreclosure whereby one firm prevents another from producing a good efficiently. The theory just explained is a different theory of foreclosure and harm to competition—it is about access to customers and downstream consumers, not about productive or manufacturing scale and efficiency.[192]

129. Relatedly, perhaps because she has in mind the wrong theory of foreclosure, Dr. Saravia also makes the incorrect claims that generic imidacloprid spot-ons were not foreclosed

[190] Saravia Report, ¶ 183.

[191] Saravia Report, ¶ 180.

[192] Tirole, J., *The Theory of Industrial Organization*, 2nd ed., The MIT Press, 1988, pp.196-197 ("Contracts as Barriers to Entry[:] It is often alleged that long-term leasing contracts or contracts that impose substantial penalties for breach foreclose access to the downstream market for entering suppliers. … [S]o the buyer accepts the exclusionary contract. We thus conclude that the buyer and the incumbent can realize the vertically integrated outcome [i.e., exclusive contract] through a long-term contract that specifies a penalty for the breach in case the buyer switches to another supplier. As we have seen, this contract creates an inefficiently low probability of entry from a social point of view. There is too much market foreclosure (too little competition).").

[redacted]

130. The same can also be said for customers whose exclusivity changed over time. If a given customer signed an anticompetitive exclusive contract from 2018 and onward, the fact that it did not sign the exclusive contract before 2018 does not address the loss of competition.[197] The fact that a wholesale customer did not buy generic imidacloprid products in 2019 (and, thus, its consumers did not have a cheaper alternative to Bayer) is not changed or mitigated by whatever the customer did or did not do in 2016. Simply referring to some other point in time or some other customer does not change the fact that Bayer's conduct foreclosed certain customers at certain points in time.

[193] Saravia Report, ¶¶ 183-184, and 167.

[194] *Id.*

[195] Saravia Report, ¶ 191.

[196] Saravia Report, ¶ 193.

[197] Saravia Report, ¶ 185 (*see, e.g.*, "Petco, another large pet specialty retailer, did not take the imidacloprid exclusivity discount during its 2016–2018 contract cycle.").

131. Dr. Saravia also speculates that downstream retailers might be able to source around Bayer's exclusive contracts in cases in which a wholesale distributor was involved.[198] That is, if an independent pet store uses a distributor who is, in turn, the wholesale customer of Bayer, she claims that the independent pet sore could simply use a second, non-exclusive distributor simultaneously. Dr. Saravia cites no examples and provides no analysis to show this is possible as a practical matter, and she cites no evidence to show there were sufficiently many non-exclusive distributors to sell to these supposed multi-sourcing retailers. But even setting aside her bare speculation, the existence of other distributors does not actually change the loss of competition created by the distributors that were exclusive. Again, the theory of foreclosure concerns Bayer shutting off particular distribution routes and limiting access to downstream consumers underlying those distribution routes. The existence of other distribution routes does not address the loss of competition that did occur.

132. [redacted]

133. In sum, my analysis focused on customers that did, indeed, agree to exclusivity with Bayer, which foreclosed Tevra and other generic competitors alike from accessing

[198] Saravia Report, ¶ 194.

[199] *See* **Exhibit 7A-7B** showing millions of doses and hundreds of millions of dollars of sales through foreclosed customers. Whether some consumers migrated to other retailers or channels does not change the fact that significantly many consumers did use the distribution routes accounted for by the foreclosed customers.

important distribution pathways to downstream consumers. By preventing generic imidacloprid competitors from selling into those pathways, Bayer harmed competition both between manufacturers at the wholesale level and between products "on the shelf" at the retail level.

B. Dr. Saravia's Use of the Term "Free-Riding" Contorts What is Actually Plain Competition from Generic Pharmaceuticals

134. Dr. Saravia also tries to justify Bayer's anticompetitive conduct by claiming that competition from generic imidacloprid products is "free-riding."[200] She asserts that competition from generic products is harmful because it reduces Bayer's incentives to advertise.[201] Under her theory, it is Tevra and other generic products that have an anticompetitive "business strategy," since their "compare-to" packaging reflects an "unwillingness to compete on the merits (e.g., by investing in marketing to boost demand for [their] products)." According to Dr. Saravia's theory, society is better off when generic products are excluded because—notwithstanding the fact that consumers may pay higher prices for the same goods—Bayer's incentives to advertise were improved.[202]

135. First, Dr. Saravia's claim that Bayer's foreclosure of generics is "procompetitive" flies in the face of extensive economic literature on generic pharmaceutical competition. Under her theory, all generic pharmaceuticals are free-riding when they take any steps to inform customers that their products are similar to or the same as pre-existing products. This is an extreme position and cannot possibly be sound economics. There are millions (if not billions) of generic pharmaceutical products sold every year in the United States—it simply cannot be that the economy is rife with allegedly harmful, anticompetitive conduct each time a generic pharmaceutical product is sold.[203] In a multitude of everyday situations, generic pharmaceuticals use "compare-to" packaging and/or generally make efforts to show they have essentially the same product as their long-introduced branded equivalents. It is absurd, extreme, and contrary to

[200] Saravia Report, ¶¶ 163-165.

[201] *Id.*

[202] Dr. Saravia falsely states that "Dr. Wong ignores the procompetitive benefits of Bayer's imidacloprid exclusivity discounts" (Saravia Report, ¶ 208). My initial report was submitted before Dr. Saravia submitted her unsupported, unreliable theory that Bayer's contracts prevent free-riding. I could not have "ignored" a claim that had not yet been made and that lacks economic and factual support. Further, I did acknowledge that exclusive contracts can have procompetitive benefits in certain applications (Wong Report, ¶ 63). This is simply a case in which there are no meaningful procompetitive benefits, as the discussion here addresses.

[203] Wong Report, n. 67.

basic common sense for Dr. Saravia to recharacterize what is well-accepted, ordinary economic activity as harmful free-riding.

136. Furthermore, the ability of generic pharmaceuticals to reference their branded equivalents is well engrained in public policy and regulation. For example, EPA and FDA regulations explicitly allow and encourage "compare-to" strategies when generic products are registered—this is the very purpose of "abbreviated" product registrations.[204] It cannot be that this practice is frequently or always harmful free-riding and yet a primary, intentional part of the U.S. regulatory framework encourages just this behavior. The true reality is that "compare-to" and reference-based marketing is an accepted, intrinsic aspect of any generic product—the generic product exists specifically because it is a lower priced *equivalent*. All generic drugs—simply for them to exist and inform consumers of their existence—must make some reference to their long-introduced branded equivalents. Again, it cannot be that all (or even most) generic drugs are harmful because they are free-riding. Dr. Saravia provides no analysis to show how or why generic imidacloprid products should be treated any differently from the countless other generic pharmaceuticals economy-wide that do the exact same thing.

137. Further still, it is absurd for Dr. Saravia to assert that generic products (specifically imidacloprid spot-ons or, generally, economy-wide) are unable or "unwilling to compete on the merits." Generic products offer drastically reduced prices for identical (or near-identical) products—those drastic price reductions are indisputably competition on the merits. Dr. Saravia is incorrect and inappropriate to characterize generic products as "anticompetitive" simply because they offer a different choice (low price, low advertising) from what she would prefer (higher price, allegedly more advertising). According to her (wrong) theories, consumers are better off paying drastically higher prices (on the order of price premiums of 50% or more) and being subjected to more advertising. That simply cannot be. The reality is that generic products offer a clearly competitive, welfare-enhancing benefit to society. Dr. Saravia is wrong to claim that consumers are better off when they are not even given the option of lower priced generics, as was the case with Bayer's conduct.

138. Second, even if Dr. Saravia's free-riding theory were entertained for the sake of argument, she has not demonstrated that the allegedly increased incentive to advertise was

[204] Wong Report, ¶¶ 36-37.

significant, let alone enough to justify consumers being required to pay 64% price premiums (or more) for imidacloprid spot-ons. She asserts that Bayer "invested tens of millions of dollars in advertising and other marketing" and that the advertising "energized competition between Advantage/Advantix and other flea and tick products as well as competition between retailers carrying flea and tick medications."[205] However, Dr. Saravia provides no analysis of these supposed benefits to competition or that they were at all of meaningful magnitude.

139. Dr. Saravia claims that Bayer's advertising increased competition between Bayer and other products. She cites to no examples (let alone extensive evidence) showing this is true. She does not show that competition significantly increased, let alone provide quantification of how much benefit that supposed increase provided. Likewise, she claims that Bayer's advertising increased competition across retailers. Again, she makes no effort to show this is true and no quantification of this supposed benefit. Rather, as I discussed above (*see* **Sections III-VI**), there is no evidence of significant competition between Bayer and any other flea and tick product. There is no basis to think Bayer's purported increased advertising improved competition whatsoever, let alone by a significant degree sufficient to, in turn, provide a significant benefit to consumers.

140. [redacted]

[205] Saravia Report, ¶ 168.

[206] *See* backup to Saravia Report, Exhibit 20.

[redacted]

142. Further, Dr. Saravia provides no analysis of Bayer's advertising and what types of advertising were or were not allegedly encouraged by foreclosing generic competitors. She provides no analysis showing Bayer's anticompetitive conduct was necessary—there are many less restrictive alternatives to Bayer's conduct, whereby Bayer could advertise and market effectively without excluding its generic competitors. For example, Dr. Saravia presents "trade funds" (and within that "Temporary Price Reductions (TPRs)") as one form of supposedly beneficial advertising that was promoted by foreclosing generic competitors.[210] Bayer could institute (or encourage retailers to institute) "Temporary Price Reductions" with equal effectiveness with or without its exclusive contracts. In fact, basic economic theory shows that Bayer would have *greater* incentive to conduct "Temporary Price Reductions" if generic

[207] Wong Report, **Exhibit 14**.

[208] Amazon, https://www.amazon.com/s?k=advantix&rh=n%3A2975384011&ref=nb_sb_noss (accessed 9/26/2023) (showing a large, video-sponsored display ad for Advantix and many "Sponsored" products despite both Pet Armor and Tevra being sold alongside Bayer's products).

[209] Chewy, https://www.chewy.com/brands/k9-advantix-ii-6500?nav-submit-button=&ref-query=advantix&ref=searchRedirect (accessed 9/26/2023) (showing no display ads and no generic competitor products); and Chewy, https://www.chewy.com/b/flea-tick-381 (accessed 9/26/2023) (showing an example of Chewy advertising with a large NexGard display ad).

[210] Saravia Report, ¶ 175.

competitor products were competing "on the shelf" adjacent to its own products. As another example, Dr. Saravia cites to a few examples of advertising that offer mail-in rebates, whereby a consumer gets a rebate if (and only if) a Bayer product is purchased. There is no reasonable way a generic product could free-ride on that advertising, let alone a reason to think such an advertising strategy required Bayer to foreclose competitors to be effective. Overall, Dr. Saravia offers no analysis or evidence for any form of advertising, let alone show advertising was causally related to Bayer's conduct or that Bayer's conduct was specifically necessary to facilitate advertising.

C. Bayer's Contracts Were Self-Reinforcing and Were Continued for Sustained Durations

143. Dr. Saravia contends that Bayer's contracts were "short in duration" and "easily terminable."[211] She states that the contracts do not cover an "extended period" and the wholesale customers could easily cancel the contracts or "could opt out of the discount and sell generic imidacloprid at any time."[212] These claims are incorrect both as a matter of economic theory and as a factual matter.

144. [redacted]

[211] Saravia Report, ¶ 182.

[212] Saravia Report, ¶¶ 197-198.

[213] Wong Report, ¶¶ 60-62, and 115.

[214] Wong Report, ¶ 62 (citing to BAH000004613 (proposal to Petco) and BAH000010171 (proposal to Petsmart)).

[215] This theory also explains why generic competitors could not simply "try again" in the next contracting cycle as Dr. Saravia suggests they should have done (Saravia Report, ¶ 200). The same anticompetitive incentive structure was present at each renewal.

[redacted]

[redacted]

[217] Saravia Report, ¶ 170.

[218] As an example, if a retailer is given a 5% discount on the wholesale price, it does not mean consumers automatically receive the same 5% discount. There are many situations in which retailers may not fully pass on a discount.

[219] [redacted]

[redacted]

D. Real-World Data Shows that Customers that Signed Bayer's Exclusive Contracts Do Not Purchase Generic Imidacloprid Spot-Ons But Do Buy Other Generic Products

147. [redacted]

[220] Joint 30(b)(6) Stipulation of Tevra Brands, LLC and Bayer HealthCare LLC, August 23, 2023, Exhibits A and B.

[221] [redacted]

[224] Saravia Report, ¶ 202.

[225] Saravia Report, ¶ 206.

[226] Dr. Saravia does not explain the data or the source. Due to her incomplete disclosure, I am unable to verify these data further. For example, it is clear that the data do not include all customers in the market or industry, but she has not disclosed enough information to validate the data further. The statistics I present are merely to show that there are seemingly facts that support my opinions even within Dr. Saravia's own unexplained data. I reserve the right to adjust the analyses of these data should Dr. Saravia provide a more fulsome explanation of the data, the sources, and the methods she used to validate that the data are, in fact, correct.

likely would have purchased (and offered at retail) significant quantities of generic imidacloprid spot-ons, just as they do for fipronil spot-ons and other chemicals.

148. [redacted]

[227] The exact time period covered by each retailer varies.

[22] [redacted]

[redacted]

150. As I noted in my initial report, "it is typical for retailers to purchase at wholesale and then offer to consumers *both* the branded and generic versions of a particular product."[230] These data re-confirm that fact, showing that wholesale customers frequently offer generic products alongside branded products, and that generic products often account for the majority (or even the vast majority) of sales if they are offered. Further, as the sales patterns for the customers that did opt into exclusivity with Bayer show, Bayer's contracts did have a significant effect, causing those customers to break from their and the industry's typical practices, as shown by the customers' simultaneous offering of fipronil generics (but zero imidacloprid generics) and the typical practices of the industry (e.g., substantial generic sales by general merchandisers). Dr. Saravia is incorrect to assert that Bayer's contracts had no or only a small effect—real-world data shows clearly that they had a significant, consistent effect and caused customers to behave significantly differently from their ordinary course practices.

E. The Scope and Magnitudes of Foreclosed Customers and Sales is Significant

151. As I discussed above, Bayer's conduct harmed competition relevant to specific large wholesale customers and distribution pathways, and in turn, specific groups of consumers. As an economic matter, that competitive harm exists whether there are many or few foreclosed wholesale customers, as consumers that underlie those wholesale customers were deprived of lower cost options and paid more than they would have had they been presented the opportunity to "trade-down" to generic products. That said, as I show here, the foreclosed customers were numerous, covered a large share of the relevant market, and accounted for a substantial amount of commerce, totaling in the tens of millions of doses per year in sales and hundreds of millions of dollars. In short, Bayer's conduct foreclosed competitors for a significant amount of commerce and was, thus, a substantial lessening of competition.

[230] Wong Report, ¶ 59.

152. [redacted]

153. First, as shown in **Exhibit 8A**, I calculated the total sales across customers that opted into Bayer's exclusivity provisions, strictly limiting to the specific time periods of opt-in that are identified in the stipulation. As I showed above, the data show that a customer opting into Bayer's exclusivity provision correlates highly (or even nearly exactly) with the customer ceasing to purchase (and offer downstream) generic imidacloprid spot-ons. As the exhibit presents, I calculate 11.3 to 16.1 million doses and $94.4 to $133.0 million in sales per year were subject to Bayer's exclusive contracts between 2016 and 2020. As a share of the relevant market for imidacloprid spot-ons, this amounts to between 31.8% and 44.4% each year (37.0% on average) based on doses, and between 34.5% and 44.9% each year (38.2% on average) based on dollar sales. These numbers show that Bayer's anticompetitive contracts foreclosed competition across a significant amount of commerce.

154. Second, as I noted in my initial report, strictly quantifying the reach of Bayer's exclusive contracts provides the minimum amount of foreclosure, since Tevra has alleged other acts and conduct by Bayer also foreclosed generic competitors.[232] Given that possibility, I have been asked to calculate the magnitude of alleged foreclosure assuming each customer that opted into Bayer's exclusive contracts was foreclosed during all years from 2016 to 2020. As shown in **Exhibit 8B**, these calculations increase the magnitudes considerably, showing alleged

[231] Joint 30(b)(6) Stipulation of Tevra Brands, LLC and Bayer HealthCare LLC, August 23, 2023, Exhibits A and B.

[232] Wong Report, ¶ 122.

foreclosure that covered at least 15.4 million doses and $128.1 million in sales per year, and accounting for an average of 50.5% to 51.9% of the relevant market for imidacloprid spot-ons.

155. Ignoring the clear significance of foreclosure of tens of millions of doses and hundreds of millions in sales each year, Dr. Saravia focuses on the fact that her calculation of the share of foreclosure falls considerably if one instead (a) calculates foreclosure based on the share of all topical flea and tick treatments[233] or (b) uses fipronil (instead of imidacloprid) sales as the unit of measure.[234] She contends that Bayer's anticompetitive conduct affected less than 30% of retailers of flea and tick products.[235] Dr. Saravia methods are unreliable and unsound, and they do not accurately measure the significance of Bayer's anticompetitive conduct.

156. First, focusing strictly on the share of foreclosure in her arbitrarily chosen set of products (either all topical flea and tick products or fipronil generics) does not actually address the significant magnitude. Again, Bayer's conduct foreclosed competition for tens of millions of doses and hundreds of millions in sales each year. That is economically significant no matter the percentage that she calculates. Furthermore, her own numbers in Exhibit 23 of her report that show 19.6% to 28.4% of "All Topical Sales" imply $188 to $286 million per year in sales were allegedly foreclosed.

157. Second, neither measure that Dr. Saravia selects (all topical flea and tick products or fipronil generics) properly quantifies the commerce that was deprived of significant competition. Generic imidacloprid competition has a significant effect on imidacloprid sales, as my extensive analysis of the relevant market definition shows. The sales that would have been subject to increased competition and, ultimately, the consumer purchases harmed by Bayer's conduct are imidacloprid sales. It makes no sense to also consider other products that were not significantly affected by Bayers conduct. Analogously, if one breaks one's leg, one would not simply wave off the issue as "insignificant" simply because that is an injury to only 25% of one's limbs. Dr. Saravia's addition of other product sales serves only to dilute the share of alleged foreclosure by adding sales that were economically and competitively irrelevant.

[233] Saravia Report, ¶ 183 (claiming that "retailers that accepted Bayer's imidacloprid exclusivity discounts accounted for less than 30% of the sales of topical flea and tick medications.").

[234] Saravia Report, ¶ 187.

[235] Saravia Report, Exhibits 23 and 24.

158. [redacted][236]

IX. Mr. Richmond's Inaccurate Characterization of My Damages Analysis and His Inappropriate, Speculative Assumptions

159. In my initial report, I propose estimates of damages owed to Tevra. The estimates comprise of the lost profits from incremental sales Tevra would have made but-for Bayer's conduct. These estimates follow standard economic theory, use standard economic methods, rely on standard evidence commonly used to assess damages, and they provide a reasonable (albeit conservative) estimate of the harm incurred by Tevra.

160. As Mr. Richmond concedes, an estimate of damages is by definition an exercise in making reasonable assumptions and predictions. A damages estimate takes as a starting point the fact that liability has been determined.[237] From that point, one *assumes* what would have happened but-for the bad act(s) and calculates the consequence of that assumption.[238] Mr. Richmond does not dispute my overall approach and method—he acknowledges that any damages estimate in this case requires one to assume liability, assume some amount of but-for sales would flow to Tevra, and calculate the difference between the actual world and the

[236] For example, if a market has 10 foreclosed customers and 10 non-foreclosed customers of equal size, the true foreclosure share would be 50%. If one arbitrarily picks 4 foreclosed customers and 8 non-foreclosed customers, one would compute 33% foreclosure (=4/[4+8]). That lower share is simply an artifact of the arbitrary sampling of the data and is divorced from the actual foreclosure share.

[237] National Research Council, *Reference Manual on Scientific Evidence*, 3rd Edition, The National Academies Press, 2011, pp. 429-430, 432.

[238] *Id.*

assumed but-for world.[239] Mr. Richmond proposes alternative assumptions that he believes are more appropriate and calculates a different magnitude of damages owed to Tevra due to his alternative assumptions. That is not actually a dispute over methods, despite his claims that it is.[240] Moreover, in an attempt to argue in favor of his own assumptions, Mr. Richmond also mischaracterizes my analysis. In this section, I clarify the ways in which Mr. Richmond has inaccurately described my damages analysis and estimates, explain why my assumptions and calculations were reasonable and supported by both economic theory and record evidence, and explain why Mr. Richmond's alternative assumptions are inappropriate.

A. Mr. Richmond's Opinion that Frontline is Dissimilar is Contradicted by Well-Accepted Economics, His Own Colleague, and by Bayer Executives

161. One of the two estimates of damages that I presented in my initial report compares Bayer's Advantage/Advantix sales to Frontline's sales.[241] The method assumes that Frontline's historical experience provides a real-world example of how a branded flea and tick product's sales will change when exposed to unrestrained generic competition.[242] As I explained in my initial report, Frontline's historical experience is also consistent with extensive economic literature on generic pharmaceutical competition.[243] If anything, Frontline presents a conservative example, as Frontline lost only 55% of its sales following generic fipronil entry from 2011 to 2016, whereas the economic literature has documented 65% or more (and often 90% or more) reductions for branded drugs once they are exposed to generic competition.[244]

162. Mr. Richmond contends that Frontline is not a comparable, instructive benchmark to Bayer.[245] He states that Frontline is inapplicable—in his subjective view—because it is a "different product (Frontline); with a different active ingredient (fipronil); sold by a different

[239] Richmond Report, ¶¶ 61-62.

[240] Richmond Report, ¶ 89 (saying the method "contain[s] errors" but then proceeding to merely list five alternative assumptions) and ¶ 90 (declaring that I make five "incorrect assumptions"). Mr. Richmond may think alternative assumptions or different method are more appropriate, but that is not the same thing as claiming there is an error in method. My method is sound and he merely disagrees with it.

[241] Wong Report, **Exhibit 12A**.

[242] Wong Report, ¶ 127.

[243] Wong Report, **Section III.B**.

[244] *Id.* (citing a variety of articles).

[245] Richmond Report, ¶ 103.

company (Merial); during a different period (2011-2018); subject to different generic alternatives (such as Sergeant's PetArmor, Sergeant's Fiproguard, Sergeant's Pronyl, and PetIQ's PetAction); that was sold to different consumers." Without basis he then states that I "fail to justify" the comparison of Frontline and Bayer.

163. First, Mr. Richmond's statement that I "fail to justify" using Frontline as a benchmark is facially and unequivocally false—he grossly mischaracterizes my analysis and he ignores (or does not understand) my plain, clear statements in my initial report. Among multiple instances, after discussing extensive economic literature on specifically generic pharmaceutical competition, I state that "Frontline's history shows a clear, analogous case study of generic substitution for specifically over-the-counter animal pharmaceuticals."[246] As another example, in assessing Bayer's and Dr. Saravia's own claims that Frontline and Bayer are in the same relevant market, I conduct extensive analyses of Bayer's and Frontline's sales histories and real-world data, discussing when and how they were similar and when and how they were different. In that discussion, I state that "Frontline's struggles are a clear reference point showing (a) the success of Bayer's conduct and (b) direct economic evidence of a lack of substitution to other non-imidacloprid products."[247]

164. Second, Mr. Richmond's assertion is contrary to economic consensus, basic common sense, and every party related to this case—it cannot be a sound opinion, let alone one grounded in fact. The economic literature on generic pharmaceutical competition shows both economic theory and extensive empirical evidence that branded drugs experience similar sales declines as what Frontline experienced when it was exposed to generic competition. Again, if anything Frontline is more conservative in Bayer's favor than had I used estimates from the economic literature directly. The economic literature on antitrust analyses and methods (and specifically natural experiments) notes that analyses of the exact sort I have done in looking at Frontline are "regularly evaluated in the pharmaceutical industry."[248] Moreover, Mr. Richmond's view is contrary to Bayer's own and to his own colleague from the same firm, Dr. Saravia, both

[246] Wong Report, ¶ 49.

[247] Wong Report, ¶ 86.

[248] Coate, p. 448.

of whom contend that Frontline is so similar that it belongs in the same relevant market.[249] Further still, Mr. Richmond's view is also at odds with Bayer's executives, whose own documents and testimony directly contradict Mr. Richmond.[250] If there is any "failure to justify," it is from Mr. Richmond's own bare assertion—it stands in the face of a mountain of evidence, analysis, and common economic understanding.

165. Third, Mr. Richmond is incorrect in multiple of the supposed facts that he contends make Frontline inapplicable as a benchmark. The time period that I use to compare Frontline and Bayer is the same relative to each product's exposure to competition—I look at the first eight years of own-generic competition for Frontline and use those years to predict the first eight years of own-generic competition for Bayer.[251] Moreover, many of the generic competitors in fipronil and imidacloprid are the same companies, such as PetIQ, which Mr. Richmond is clearly aware of.[252] Further still, Frontline and Bayer were clearly sold to the same end-customer retailers.[253] Mr. Richmond claims I am "fail[ing] to justify," but it does not appear he checked even the few surface-level facts he purports support his own bare assertion.

166. Fourth, Mr. Richmond asserts that differences in patent terms between Frontline and Bayer render a comparison of the two inaccurate.[254] He provides no analysis or supporting economic theory to explain why this is the case—and, in fact, none exists. The patent terms would only—at most—affect firms' ability to enter promptly. But in both Frontline's and Bayer's cases, the own-generic competitors entered almost immediately and in similar magnitudes. As I showed in my initial report, four generic fipronil brands entered in late 2010 or 2011, and four generic imidacloprid brands entered in late 2015 or 2016. Likewise, Mr.

[249] Order Denying Defendant's 12(b)(6) Motion To Dismiss Second Amended Complaint filed January 6, 2022, p. 9 ("Unsurprisingly, Bayer takes issue with the adequacy of this pleading, arguing that Tevra's relevant market is implausibly narrow and excludes the most direct and obvious competitor—Frontline, a fipronil topical."); Saravia Report, ¶¶ 70, 72-73. To be clear, it is my opinion that Bayer's Advantage/Advantix and Frontline are analogous across many economic factors, and thus can be compared to one another to draw inferences. That said, I have tested the question empirically as to whether, due to their similarities, the two products are within the same relevant antitrust market. My analysis of real-world data shows that they are not in the same relevant market despite being analogous in many ways.

[250] Wong Report, ¶ 50 (summarizing evidence from Bayer).

[251] Wong Report, **Exhibit 12A**.

[252] Richmond Report, ¶¶ 26-29.

[253] *See* **Exhibits 7A-7B**.

[254] Richmond Report, ¶ 104 (asserting without any economic theory of factual support that Bayer's patent term "undermines Dr. Wong's assumed comparability").

Richmond himself observes that four generic fipronil brands compete against Frontline,[255] and six generic imidacloprid brands entered between late 2015 or 2017. Finally, as I discuss in **Section VIII.A** and show in **Exhibit 7A**, harm exists because generic competitors (which had already entered) were denied access important wholesale customers and distribution pathways. Whether Bayer's patent continued past 2016 or not is beside the point—the theory of foreclosure in this case concerns an entirely different issue.

167. Finally, as I also noted in my initial report, a calculation of damages based on Frontline's history and a calculation of damages based on Tevra's pre-entry forecasts generate similar results.[256] The two methods serve as a cross-check of one another, demonstrating the reasonableness of both. That is, both methods are widely used approaches that independently generate similar results. Mr. Richmond is incorrect to claim that Tevra's sales projections are "untested."[257] My estimates of damages based on Frontline's history derive from well-accepted economic theory and extensive analysis of real-world data. By comparing Tevra's sales projections to my estimates based on Frontline's history, I am doing the very "test" that Mr. Richmond claims is missing.

B. Mr. Richmond's Opinion Mischaracterizes My Comparison Between Bayer and Frontline

168. Richmond overinterprets my damages estimate based on Frontline. He seems to ignore (or misunderstand) what analysis I have actually done and the analysis and evidence discussed throughout my initial report. Further, his discussion of my analysis mischaracterizes it and misleadingly summarizes what is a perfectly reasonable, standard approach.

169. First, my analysis of Frontline is based on aggregate effects across a large set of customers as a group. That is, I start by constructing a benchmark based on the overall sales history of Frontline, which accounts for tens of millions of doses per year sold to many wholesale customers. The trend over time that I calculate quantifies the net aggregate substitution away from Frontline, including switching to generic fipronil competitors and other products (namely Seresto, orals, and other flea and tick treatments). The estimate does not (and need not) calculate the specific rates of substitution to any one product, nor does it calculate the

[255] Richmond Report, ¶ 103.

[256] Wong Report, ¶ 131.

[257] Richmond Report, ¶ 138.

specific rates of substitution for specific customers. Any one customer might have seen much or little substitution away from Frontline, just as the rate of substitution away from Frontline could have been fast or slow for that particular customer in a particular year. The estimate only looks at the aggregate overall effect across multiple customers to quantify the net effects of competition on Frontline.

170. I assume those aggregate effects for Frontline predict the likely effect of free, unrestrained competition on a branded product. Then, taking the significant group of customers that were foreclosed from competition by Bayer's conduct—likewise, consisting of tens of millions of doses per year sold to multiple customers—I use the aggregate trend for Frontline to predict Bayer's but-for sales trend for those customers in aggregate.[258] The calculation predicts on the net, aggregate sales to the group of foreclosed customers—it does not assume any one customer substituted at a particular rate or a particular time. In the but-for world, a particular customer may well have substituted away from Bayer extensively or not so much—the analysis does not attempt to identify which was which, and nor does it need to.

171. Likewise, my calculation of Bayer's actual sales (which is used to compute the incremental amounts) looks at the aggregate for the significant group of customers that were foreclosed from competition by Bayer's conduct. The actual calculation does not discriminate a particular customer's actual substitution (or not) nor does it pinpoint a particular customer's change at a particular time. It does not need to do such a customer-by-customer calculation. By definition, the actual total sales for the group will capture any/all actual net changes to the individuals in that group. For example, if a particular customer was only foreclosed for some years and not others, its actual sales will reflect that variation over time and, in turn, that variation will be captured in the aggregate total for the group.

172. [redacted]

[258] As I explained in my initial report, a customer-by-customer matching and estimation method is not possible, since Frontline primarily relies on distributors (who then sell to retailers), whereas Bayer primarily sold direct to retailers (Wong Report, ¶ 147).

[259] Richmond Report, ¶ 99.

[redacted]

173. Second, related to the above point about actual sales, my approach accounts for any aggregate net substitution to other non-generic-imidacloprid products, to the extent such substitution occurred. That is, my analysis of Frontline's aggregate trend captures substitution to both generic fipronil products and other products. Similarly, the actual aggregate trend for Bayer's foreclosed customers captures any substitution to other products that might have occurred. Once Bayer's actual sales (which account for substitution to other products) are compared to the sales predicted by Frontline's history (which account for both substitution to other products and generic competitors), the parallel effects of substitution to other products cancel as a matter of economics and statistics,[262] and the calculation isolates the incremental effect of Bayer's conduct, which blocked substitution to generic competitors.

174. [redacted]

[260] Wong Report, **Exhibit 12A**.

[261] As noted above, since the actual sales to PSP are incorporated into the damages calculation, any changes over time for PSP would be accounted for. For example, if PSP behaved as Mr. Richmond states and purchased from Tevra, that would lower Bayer's actual sales to PSP, thereby reducing or eliminating any PSP-specific excess sales from the estimates.

[262] The ability to isolate specific effects (and cancel common effects) is precisely the empirical framework that underpins difference-in-differences regressions, as I discussed above in **Section V**.

[263] Wong Report, **Exhibit 12A**.

elsewhere. In comparison, Frontline's sales declined 57.6% from 2010 to 2016, of which generic competitors accounted for 37.0 percentage points and other substitution accounts for the other 20.6 percentage points based on the available data.[264] Once the two numbers are compared, the damages estimate isolates the effect specific to generic substitution of 32.6% (=57.6%-25.0%=37.0%+20.6%-25.0%). This effect is actually a conservative estimate in Bayer's favor since Bayer's actual decline (25.0%) exceeds Frontline's non-generic other product decline (20.6%).

175. Thus, effects from other products (and industry-wide effects generally) *are* accounted for in my analysis. Mr. Richmond seems to ignore (or not understand) this aspect of my analysis. He makes multiple claims that are simply incorrect and misleading as he has presented them. He says that I assume "100% of this sales decline was due to generic competition."[265] He also says that I "fail[] to analyze and discuss whether these new product entrants explain some or all of Frontline's sales decline."[266] Neither statement is true or accurate whatsoever—my damages estimate does not simply assume all substitution to moves to generic products, and my analyses account for industry-wide issues such as these. Further, there are whole sections of my initial report and further discussion above throughout this report addressing extensive analysis on precisely these issues (*see, e.g.,* **Section V.C**).

176. Third, my analysis looks in aggregate by year—it does not do a month-by-month or day-by-day analysis of the foreclosed customers. Sales to wholesale customers are lumpy and vary over time, since customers tend buy inventory in larger portions and draw those portions down for downstream sales and/or distribution over time.[267] My analysis does not breakdown a specific customer's sales within a year or assume the exact manner in which a customer might shift sales within a year in moving from the actual to the but-for world. Rather, my analysis assumes an aggregate portion of each year's sales (for the aggregate group of customers) would

[264] *See* Wong Report, **Exhibit 3B**. Frontline's decline was 42.0 million doses from 2010 to 2016. As of 2010, generics accounted for zero doses (they had not entered yet), and as of 2016, generics accounted for 27.0 million doses. This implies generics accounted for 37.0 percentage points of the overall 57.6% decline for Frontline.

[265] Richmond Report, ¶ 107.

[266] Richmond Report, ¶ 105.

[267] [redacted].

shift away from Bayer. As noted above, any one customer might change in greater or lesser degrees, just as any one customer might move its purchases within a year.

177. Again, Mr. Richmond seems to ignore (or not understand) this aspect of my analysis. He asserts that my estimate that Tevra would have sold 0.7 million doses "during 2017 [is] contradicted by the available record."[268] Mr. Richmond himself acknowledges that Tevra had entered by mid-2017, leaving ample time for it to have made sales of 0.7 million doses to wholesale customers during the second half of 2017. It is reasonable to think that amount of volume—only 3% of Bayer's actual sales to foreclosed customers in that year—could have been purchased and sold downstream or purchased and stored as inventory by wholesale customers. Mr. Richmond has no basis to say this is supposedly "contradicted" by the record—it is not contradicted, it is subject to sound economic theory, and my calculation shows a reasonable assumption.

178. Fourth, related to the above points about customers and timing, Mr. Richmond's criticisms of my calculations for 2016 are inapt.[269] It is true that Frontline's history shows that Bayer outperformed the level of sales it would have likely achieved in the but-for world in 2016, as I show in my calculations.[270] The amount in that one year is small, and my analysis makes no assumption one way or another for those sales in 2016. The existence of that estimate does not invalidate the method or the assumption that Tevra would have gained sales from 2017 onward.

C. The Estimated Damages Do Not Change Significantly if One Uses Bayer's List of Customers in Its 30(b)(6) Stipulation

179. [redacted]

[268] Richmond Report, ¶ 93.

[269] Richmond Report, ¶¶ 110-111.

[270] Wong Report, **Exhibit 12A**.

[271] Joint 30(b)(6) Stipulation of Tevra Brands, LLC and Bayer HealthCare LLC, August 23, 2023, Exhibits A and B.

180. [redacted]

182. As noted above, my method of estimating damages based on Frontline accounts for potential changes in foreclosure over time by incorporating actual sales. That is, for example, suppose a hypothetical customer opted into exclusivity for two years, did not opt into exclusivity for two years, and then opted into exclusivity for two more years. *If* the actual degree of foreclosure followed that timeline, as Mr. Richmond seems to suggest, it would mean that the

[272] Richmond Report, ¶ 100 (citing to the stipulation dated August 23, 2023).

[273] Wong Report, ¶ 122.

[274] Richmond Report, ¶ 101 (observing that 5 of 17 customers did not opt into exclusivity for "the entire damages period").

customer was unrestrained in those intervening two years, and its actual sales would adjust commensurately. If that theory is correct, one would see actual sales that are higher for Bayer in the first and last two-year periods due to the effects of foreclosure, and actual sales that are lower for Bayer in the middle two years due to removing the effects of foreclosure. In turn, the damages estimate would account for that lower actual sales during the middle two years and estimate lower or zero (or even negative) excess sales. However, *if* the actual degree of foreclosure is more persistent (e.g., due to the practical effect lasting longer than the literal contractual or due to other contractual provisions or conduct), actual sales would adjust commensurately to that fact pattern. In that case, one would see actual sales that are higher for Bayer in in all years, since there were foreclosure effects pushing up actual sales even in the middle two years when that contract provision was not in place. And, in turn, the damages estimate would account for that, estimating excess sales due to actual effects, even if the literal, contract provision was not present.

183. [redacted]

[redacted]

[275] [redacted]

184. As **Exhibit 9A** presents, the damages estimate does not change considerably after adding the additional foreclosed customers disclosed by Bayer. Rather, the overall estimate falls by a small amount due to an increase to the 2015 sales baseline.[276] Whereas I had originally calculated Tevra would make incremental sales of 36.8 million doses, the calculation incorporating that new information decreases to 36.0 million doses (-2% overall).

185. [redacted]

186. Analogous to what I did in my initial report, I calculate the lost profits associated with the incremental but-for sales gains by Tevra. These estimates are presented in **Exhibits 10A and 10B**, and they are analogous to Exhibit 13A shown in my initial report. The updated estimate shown in **Exhibit 10A** (i.e., the conservative best available) shows between $90.0 million and $106.6 million in lost profits for Tevra.

[276] That is, the extra customers exhibit a steeper decline in their actual sales, bringing the actual and but-for sales closer together. This is conservative and reflects what is discussed above—actual sales already addresses any changes in foreclosure over time within the set of foreclosed customers.

[277] [redacted]

187. To be clear, the fact that I show three different estimates across my initial report and here based on the same overall method does not show inconsistency or invalidity. The general method across all of them (i.e., comparing Bayer's actual sales to what is predicted by Frontline's history) is the same. Rather, my original estimate was a conservative estimate based on the available record at the time.[278] It is my opinion that the new estimate shown in **Exhibits 9A and 10A** is the most appropriate estimate based on the available record at present, and the alternative estimate shown in **Exhibits 9B and 10B** is a less accurate alternative meant to show the implications for the approach seemingly suggested by Mr. Richmond. The estimates combined show the best estimate at the current time (**Exhibit 9A**) and, generally, the conservative minimum (**Exhibit 9B**) based on alternative assumptions working in Bayer's favor. As I noted before, it will be straightforward to adjust the calculations presented here to the set of customers the court and/or finder of fact deems most appropriate.

D. It Is Reasonable to Assume Tevra Would Have Been the Primary Imidacloprid Generic Product Offered by the Foreclosed Customers

188. In the baseline damages estimates based on Frontline's history, I assume that Tevra would capture the excess sales attributable to Bayer's exclusionary conduct. As I explained in my initial report, this assumption is based on a variety of evidence and economic theory.[279] That said, it is an *assumption* based on the available record and economic theory. As I noted before, it will be straightforward to adjust the calculations that I present to reflect the assumed share of sales to Tevra that the court and/or finder of fact deems most appropriate.[280]

189. Mr. Richmond disagrees that Tevra would have obtained most or all of the generic imidacloprid sales to foreclosed competitors. He instead claims that Tevra would have only obtained 1% or less of Bayer's excess sales.[281] In attempting to defend his own assumption, he falsely claims my assumption is "unsupported" (it is not) and proposes certain facts he claims

[278] Wong Report, **Exhibit 12A**.

[279] Wong Report, ¶ 129.

[280] For example, if one thinks Tevra would have obtained 90% of Bayer's excess sales, the calculation can be modified by Column (7) of **Exhibit 9A**.

[281] Richmond Report, ¶ 128 and Table 19.

support his own assumption.[282] My assumption is not "unsupported" nor "without any analysis"[283]—Mr. Richmond simply ignores the evidence and economic theory that I presented.

190. [redacted]

[282] Richmond Report, ¶ 109.

[283] Richmond Report, ¶ 126.

[284] Wong Report, ¶ 129.

[285] Perrigo owned both Pet Armor and Sergeants from 2012-2019. The two brands combined account for the percentages cited above. In 2019, PetIQ acquired Perrigo's brands, consolidating those two brands with PetIQ's Pet Action. Thus, for the period discussed from 2016 to 2019, the two companies' brands were competing with one another. *See* "FidoPharm launches fipronil-permethrin combination product," 4/17/2013, https://www.dvm360.com/view/fidopharm-launches-fipronil-permethrin-combination-product (accessed 9/26/2023); "Perrigo Company To Acquire Assets Of Sergeant's Pet Care Products, Inc., For $285 Million," 9/13/2012, https://investor.perrigo.com/2012-09-13-Perrigo-Company-To-Acquire-Assets-Of-Sergeants-Pet-Care-Products-Inc.-For-285-Million (accessed 9/26/2023); "PetIQ, Inc. Enters Into Definitive Agreement to Acquire Perrigo Animal Health," 5/8/2019, https://www.globenewswire.com/news-release/2019/05/08/1819728/0/en/PetIQ-Inc-Enters-Into-Definitive-Agreement-to-Acquire-Perrigo-Animal-Health html (accessed 9/26/2023).

[286] Wong Report, **Exhibits B5-B8**.

[287] *Id.*

[288] *Id.*

[redacted]

192. Second, I had also noted in my initial report that Tevra had competitive or better pricing than other generic competitors.[292] In the retail data I had presented in my initial report, Tevra's average retail price was $10.37, $9.33, and $9.35 per dose in 2017, 2018, and 2019, respectively. In comparison, PetIQ (the largest other generic competitor) progressively increased its average price from $9.94 to $10.14 to $10.25 per dose in those same years, respectively. As of 2019, Tevra's average retail price was second lowest, lower than PetIQ and Capinnovet but higher than Perrigo[293] (Meridian and Fido Pharm). From 2019 to 2023, the available data show that Tevra's wholesale price has fallen by approximately 19%, moving from $5.40 per dose to $4.35 per dose. These real-world pricing data suggest that Tevra was able to (and, generally, *did* historically) bid more aggressively and offer wholesale customers better prices. This is fully consistent with the assumption that Tevra would be the primary or even sole seller of generic imidacloprid spot-ons to a particular set of wholesale customers.

[289] *See* my backup materials for this report.

[290] *Id.* Even if some customers offered private label products in the but-for world, Tevra could have been the supplier of those products, just as it did with Chewy's Onguard (Richmond Report, ¶ 114).

[291] *Id.* By year, Tevra's share is higher and trending upward toward a much higher percentage. In 2019, 2020, and 2021, Tevra accounted for 58.7%, 80.6%, and 66.6%, respectively, of PSP's generic fipronil sales.

[292] Wong Report, **Exhibit 3C**.

[293] Richmond Report, ¶ 26.

193. [redacted]

194. Fourth, had Tevra gained the volume and scale that is predicted under the damages estimates, it would have gained additional operating efficiency, allowing it to compete even more effectively. For example, Tevra's gross and operating margins have improved progressively as it has grown as a company.[299] That improving margin, suggestive of improving efficiency, could have been utilized to then improve upon its already competitive (or superior) pricing relative to other generic imidacloprid companies.

195. Mr. Richmond disputes whether Tevra could gain the sales I show in my damages analysis. He focuses on other aspects he believes supports his assumption. These other aspects do not generally dispute the facts I presented—rather, they appear primarily intended to distract

[294] Wong Report, **Exhibit 3C** and ¶ 129.

[295] Richmond Report, ¶¶ 27, and 124-125.

[296] [redacted]

[297] Mr. Richmond notes that another competitor, CAPInnoVet, was supplied by CAP IM (Richmond Report, ¶ 29). It is possible this competitor faced patent litigation risk as well given it relied on CAP IM, the manufacturer sued by Bayer.

[298] Meurer, Michael J., "Allocating Patent Litigation Risk Across the Supply Chain," *Boston University School of Law, Law and Economics Research Paper Series*, 2018.

[299] Wong Report, **Exhibit 10**.

from the key, real-world evidence that I present. I disagree with his claims—the compelling economic evidence shows Tevra would have won Bayer's excess sales.

196. First, Mr. Richmond claims that the other competitors had an earlier start than Tevra, and that this would have been a competitive advantage in their favor.[300] He states that my estimate of some excess Bayer sales in 2016 show that other competitors would have gotten a head start. [301] As stated above, while my estimates show Bayer had a small amount of sales above the but-for amount in 2016, I do not assume one way or another how those sales would have moved. There is not a strong economic basis to think this small amount would be an insurmountable head-start. As an example, as noted above, Tevra was able to supplant the majority of Perrigo's sales of generic fipronil spot-ons to PSP in its very first year, despite Perrigo brands having been offered in the industry since 2010 or 2011 (i.e., a so-called head-start of eight or nine years). Further, as an economic matter, a small number of marginal sales in 2016 would not have outweighed Tevra's better pricing and other competitive advantages over time, as I discussed above.

197. Second, Mr. Richmond cites to some examples that he interprets as showing Tevra had some struggles with retailers, mostly outside of the set of foreclosed customers.[302] He also cites two instances in which a pet specialty retailer switched their private label supplier of fipronil spot-ons to another supplier.[303] In general, it is my view that Mr. Richmond overstates these examples—they actually tend to be more positive or neutral toward Tevra, not the negative views that he claims:

a) The Chewy example he cites is an example of Bayer's anticompetitive conduct. The document states that Chewy representatives were "all in" (suggesting interest in Tevra) but then changed their tone since, "We then learned that Chewy had a contract with Bayer and could not offer a generic to K9Advantix II."[304]

[300] Richmond Report, ¶¶ 121-122.

[301] Richmond Report, ¶¶ 110-111.

[302] Richmond Report, ¶¶ 112-113.

[303] Richmond Report, ¶¶ 114-115.

[304] TEVRA-00162830-2.

b) The Costco email he cites is neutral—it does not speak to the merits of Tevra's imidacloprid product one way or the other.[305]

c) The Kroger sales example lacks sufficient information—Tevra representatives do not seem to have known precisely why Kroger used another supplier.[306]

d) The Meijer email thread he cites is also inconclusive—it ends with a response from Tevra explaining why Meijer's initial impression about efficacy was mistaken.[307] The example does not inform the question one way or another.

e) The Walmart example simply states that it was not looking for a change "at this time" at a particular point in 2019.[308]

These examples do not show convincing evidence that Tevra could not and would not make significant sales to the foreclosed customers. The examples show a few isolated instances, and they are only incomplete snippets of those instances across what appear to be dynamic, ongoing sales and marketing relationships.

198. Moreover, there are other equivalent or more convincing examples that point in the other direction, such as the fact that Tevra accounts for the vast majority of the sales units of among imidacloprid spot-ons for two prominent customers (Amazon and PSP) according to the data that Dr. Saravia submitted.[309] Further still, as some of the examples note, Tevra's brand recognition was an important driver[310]—in the but-for in which Tevra received significantly more and growing sales, this would have been a strength rather than the alleged headwind it was due to Bayer's conduct in the actual world.

199. Third, Mr. Richmond claims that Tevra did not have the capacity to make the but-for sales and it was "a start-up company."[311] His claim is incorrect and ignores the basic economic realities of the pharmaceutical industry. As both Bayer's very high margins and Tevra's moderate margins show,[312] the incremental but-for sales would have directly addressed

[305] TEVRA-00498008-11.

[306] TEVRA-00345262.

[307] TEVRA-00577243-4.

[308] TEVRA-00336560-1.

[309] *See* the backup materials to this report. *See also* **Exhibit 7B**.

[310] TEVRA-00162830-2.

[311] Richmond Report, ¶ 117.

[312] Wong Report, **Exhibit 10**; *see also* **Exhibit 6**.

Tevra's so-called "limited/negative cash, operating losses, and negative equity"[313]—this is precisely illustrative of the harm created by Bayer's conduct and would not have existed in the but-for world. Likewise, Mr. Richmond himself acknowledges Tevra's products are outsourced to contract manufacturers[314]—because of this, Tevra was not capacity-constrained and its supply could have been scaled up or down as needed.

200. Finally, Mr. Richmond claims that the larger sales volumes of other generic imidacloprid companies from 2016 to 2019 show Tevra could not have gained significant sales.[315] The numbers he presents are precisely illustrative of Bayer's anticompetitive conduct as well. Tevra's low sales volume in the actual world is because the customers Tevra attempted to market to are the ones Bayer's anticompetitive conduct foreclosed it from winning. Other competitors appear to have focused more on other customers (namely, general retailers)[316] and they had more success because they were less exposed to Bayer's anticompetitive conduct. That does not show a lack of competitiveness from Tevra—it simply shows that Tevra was the unlucky victim of the bulk of Bayer's anticompetitive conduct.

E. My Assumed Sales Prices and Profit Margins are Based on Actual Real-World Data

201. The wholesale prices and profit margins I use for my damages estimates are based on the best available data and are tied to what Tevra actually charged and earned in the real world.[317] It is my opinion that these are the most appropriate, comprehensive data to use for the calculation. Mr. Richmond disagrees, and cites isolated examples he purports show lower prices and profit margins. He does not do any actual analysis of these examples to show whether they can be extrapolated and applied to an alternative damages estimate, or if extrapolated, his examples would actually matter. In short, Mr. Richmond speculates (wrongly) that I have used pricing and margins that are too high, but provides no actual comprehensive alternative and no actual data or calculations to show one would get a significantly different estimate of damages.

[313] Richmond Report, ¶ 117.

[314] Richmond Report, ¶ 18.

[315] Richmond Report, ¶ 126 and Table 18.

[316] Wong Report, **Exhibits B1-B4** (showing the vast majority of the generic imidacloprid competitor sales come from the general retailer (i.e., Nielsen) sales channel).

[317] Wong Report, **Exhibits 13A-13B**; **Exhibits 10A-10B**.

202. Regarding pricing, there is no comprehensive data in the record showing Tevra's imidacloprid wholesale prices for 2017 to 2020 that I am aware of—Mr. Richmond also does not identify any data to address this question. Because of this, I estimated Tevra's average market-wide wholesale prices based on the market-wide prices observed in the Elanco retail data.[318] It is my view that these are reasonable estimates—they are based on undisputed market-wide data (i.e., capturing a representative sample of most or all of Tevra's actual sales), and they show a consistent historical trend when matched to the 2021 to 2023 data where I calculated Tevra's wholesale prices directly.

203. Mr. Richmond instead cites to a prospective business plan (outlining potential prices) and two proposals Tevra made to customers.[319] He contends these three isolated examples "contradict" my "pricing assumptions."[320] His claims are inaccurate and inappropriate. My estimates are based on what Tevra actually charged and what the real-world data actually show. My estimates, based on real, market-wide data, are not "assumptions," nor can a two proposals with promotional pricing "contradict" what Tevra actually charged across all its customers.

25. [redacted]

[318] Wong Report, **Exhibit 13A**.

[319] Richmond Report, ¶ 130.

[320] *Id.*

[321] My initial damages estimates implied that Tevra's revenue would grow approximately two- to four-times what it was in the actual world. Wong Report, **Exhibit 13A**.

[322] Pindyck and Rubinfeld, pp. 241-243.

[323] An 87% gross margin is the minimum of the CAP gross margins, as show in **Exhibit 6**. If one instead uses the 93% (or more) gross margin for Advantage/Advantix shown in Bayer's transaction data, the cost falls to $0.60 per dose.

[324] Richmond Report, Table 21.

thus, cost per dose) would have improved even more significantly than the conservative real-world numbers I use.

204. Mr. Richmond claims my calculations of margins are overstated without any comprehensive analysis or showing of what he believes margins actually are. First, he claims that Tevra had lower profit margins in its royalty payment calculations, stating that he believes the profit margins were "41.5% for the second half of 2019 and 46.5% for 2020.[325] Second, he alleges that the profit margins I used "exclude[] categories of expenses" and that "accounting" for these unnamed expenses would lower profit margins.[326] Neither criticism is correct, and either way, he provides no actual analysis showing this would significantly impact the final damages estimate.

205. The lower profit margins that Mr. Richmond cites appear to be incomparable to the margins I utilize. For example, his calculations show "rebates" that are often 10% to 20% of revenue, lowering the margins he calculates considerably.[327] In Tevra's overall P&L statement that I utilize, the recorded total actual rebate is only $0.01 for the entire 2017 to 2023 period.[328] But even setting that aside, the numbers Mr. Richmond suggests are not significantly different from the real-world numbers I use. For example, he calculates a margin of 46.5% for 2020, and I calculate a Direct Margin of 47.9% for 2020. There is no reason to think my calculations are significantly misstated, and Mr. Richmond provides no complete data for any other year besides 2020 that would show the estimated damages would actually significantly change.

206. Likewise, he alleges that the profit margins should include additional cost categories. He cites general examples (e.g., "personnel expenses") but does not elaborate or actually do any analysis. I disagree with his general contention—the sorts of costs he identifies, such as personnel, would not have increased incrementally. In the but-for world, Tevra would have simply had better success based on the same efforts it actually expended (only to be stymied by Bayer's conduct). If anything, this suggests higher margins, since the but-for sales would grow incremental revenue with minimal or no extra costs. Again, even setting that aside,

[325] Richmond Report, ¶ 133.

[326] Richmond Report, ¶ 134.

[327] *See*, e.g., TEVRA-00123093.

[328] Backup to Wong Report, **Exhibits 13A-13B**, at "Profit and Loss".

Mr. Richmond's comment is vacuous and untestable—he provides nothing to actually show that my calculations are overstated, let alone enough to show they would significantly change.

F. Mr. Richmond's Alternative Calculation Ignores the Clear Evidence of the Effect of Bayer's Conduct

207. As an alternative to my damages estimates, Mr. Richmond proposes his own calculation based on Tevra's actual imidacloprid spot-on sales to other customers. Mr. Richmond's calculations amount to (a) assuming Tevra's incremental but-for sales are approximately equal to Tevra's actual historical sales and (b) applying a lower profit margin to those incremental sales than I have used in my calculations.[329] I disagree that this is a reliable and accurate method.

208. [redacted]

209. Mr. Richmond's estimate also implies but-for world in which Bayer retains a supracompetitive volume of sales. His numbers imply Tevra captures $551 thousand to $3.5 million out of Bayer's more than $100 million sales per year. If he means to imply that Bayer

[329] Richmond Report, Figure 2.

[330] Wong Report, **Exhibit 11S.**

[331] Richmond Report, ¶ 151.

[332] *Id.*

would lose only a 1% or 2% of its volume, it would mean that Bayer maintains a level of sales and market share that is still consistent with monopoly power and anticompetitive conduct. Such a high level of sales and market share—despite being exposed to supposedly more generic competition—is contrary to the economic literature and the historical example of Frontline.[333] In this case, the damages model should be consistent with a but-for world with free and clear generic competition and results that reflect that free and clear competition. Instead, Mr. Richmond's calculations do not show a credible or reasonable but-for world—they simply assume the but-for world is almost identical to the anticompetitive status quo.

210. Beyond Mr. Richmond's assumption of implausibly low sales, he applies too low of a profit margin. As discussed above, one should use the actual real-world profit margins reflected in Tevra's data, and even those are likely conservative. Mr. Richmond's profit margins are below those real-world data points. This choice has an additional effect of understating the damages versus the more correct and appropriate amounts that I calculate.

G. Further New Information, Damages Period, and Other Instructions from the Court

211. Should further new, material information be disclosed subsequent to this report, I will adjust my estimates accordingly.

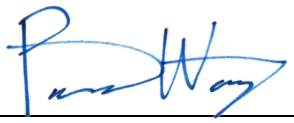
212. Furthermore, I understand from Mr. Richmond's report that Bayer contends any damages owed should be terminated once it was acquired by Elanco.[334] From an economic perspective, that is an arbitrary distinction with no economic effect—the same economic entity continues to exist, the conduct at issue continued, and the harm to Tevra continued past that point. Because of that view from an economic perspective, I have quantified the estimated damages to the present based on the available data in the record. That said, my damages estimates can be adjusted to any time period the court and/or finder of fact deem appropriate. Should that body decide a particular time period is warranted, it will be straightforward to adjust my estimates.

213. Similarly, my damages estimates do not include a calculation of prejudgment interest or account for trebling or other aspects that the court and/or finder of fact may deem

[333] Wong Report, **Section III.B**; *see above* **Sections III-V**.

[334] Richmond Report, ¶ 94.

necessary. Should those calculations be necessary and requested, it will be straightforward to adjust my estimates.



Paul Wong, Ph.D.

Signed September 28, 2023

Exhibit 1

Paul Wong, Ph.D.
Managing Director

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San Francisco, CA 94111-4156
Direct +1 (415) 291-1030
paul.wong@nera.com
http://www.nera.com/experts/paul-wong.html

PAUL WONG
MANAGING DIRECTOR

Dr. Wong is a member of NERA's Health Care and Life Sciences practice, and NERA's Antitrust and Competition practice. Since joining NERA, Dr. Wong has consulted on a variety of health care mergers, including the *Advocate-NorthShore* and *Jefferson-Einstein* hospital mergers challenged by the Federal Trade Commission, the *Aetna-Humana* and *Centene-Health Net* health insurance mergers, as well as mergers involving major provider systems in more than 20 states. Dr. Wong has also consulted on antitrust litigations in health care and other industries, including those involving hospitals, multispecialty physician groups, health insurers, health IT providers, laboratories, medical devices, medical supply distribution, and hospital equipment supply and rental. Of note, Dr. Wong was the lead consultant for *USA v. Carolinas Healthcare System*, involving "steering provisions" in hospital reimbursement contracts, *State of Washington v. Franciscan Health System*, involving the challenge of two consummated acquisitions of physician groups, and *FTC v. Surescripts*, involving the challenge of loyalty discounts in the electronic-prescribing health IT industry.

Prior to joining NERA, Dr. Wong received a Ph.D. and an M.A. in Economics from Stanford University, and a B.A. in Business Economics from University of California Los Angeles (UCLA). Dr. Wong has professional experience in healthcare services research and healthcare analytics from his prior work at Palo Alto Medical Foundation Research Institute, and experience as an investment manager from his prior work at Brandes Investment Partners.

In addition, Dr. Wong has taught economics at the Anderson Graduate School of Management at the University of California Riverside (UCR). Dr. Wong has also conducted academic research on a variety of healthcare and antitrust issues, and published articles in journals such as *Population Health Management*, *Loyola University Chicago Law Journal*, *Antitrust Chronicle*, and *Competition*. Notably, Dr. Wong has written multiple papers analyzing competition and regulation in the US health insurance industry. As well, Dr. Wong has researched the impact of patient-centered care on patients' medical costs, and how competition impacts patenting and innovation in agricultural biotechnology. Dr. Wong has presented seminars to a number of organizations, including the US Department of Justice, the American Society of Health Economists, the American Health Lawyers Association, the American Bar Association, and the Indiana State Legislature.

Exhibit 1

Education

	Stanford University
2015	Department of Economics Ph.D., Economics
	Stanford University
2015	Department of Economics M.A., Economics
	University of California, Los Angeles
2008	Department of Economics B.A. (summa cum laude), Business Economics

Professional Experience

	NERA Economic Consulting
2023-pres.	Managing Director
2021-2023	Director
2019-2021	Associate Director
2016-2019	Senior Consultant
2015-2016	Consultant
	University of California, Riverside **A. Gary Anderson Graduate School of Management**
2018-2020	Lecturer
	Stanford University **Department of Economics**
2012-2015	Teaching Assistant
	Palo Alto Medical Foundation Research Institute
2013-2015	Research Assistant
	Brandes Investment Partners
2008-2010	Research Associate

Testimony and Expert Disclosures

2023	*Los Alamitos Medical Center, et al. v. Kaiser Foundation Hospitals and Kaiser Foundation Health Plan, Inc.*, JAMS, Expert Deposition of Dr. Paul Wong, March, 10, 2023.
2022	*Indiana State Legislature, Interim Study Committee on Public Health, Behavioral Health, and Human Services*, Testimony Re: Healthcare Provider Market Structure, Market Concentration, Pricing, and Competition, October 20, 2022.

Exhibit 1

2021	*NRT Technology Corp. and NRT Technology, Inc. v. Everi Holdings, Inc. and Everi Payments, Inc.,* D. Del., Declaration of Dr. Paul Wong In Support of Plaintiffs' Motion to Compel Production of Documents and Data by Defendants, May 16, 2021.
	Huntington Hospital and Cedars-Sinai Health System v. California Department of Justice and Matthew Rodriguez, Superior Court of California, County of Los Angeles, Expert Report by Dr. Paul Wong, March 29, 2021.
	Canopy Health v. Western Health Advantage, JAMS, Expert Testimony of Dr. Paul Wong, February 1, 2021.
2020	*Canopy Health v. Western Health Advantage*, JAMS, Expert Deposition of Dr. Paul Wong, December 22, 2020.
	Terri Blackburn v. Bellingham Anesthesia Associates, JAMS, Expert Report of Dr. Paul Wong, December 9, 2020.
2019	*Jason Toranto v. Daniel Jaffurs, Amanda Gosman, Rady Children's Hospital-San Diego, Rady Children's Specialists of San Diego, Rady Children's Medical Staff, Children's Hospital of Orange County, and CHOC Medical Staff*, S.D. Cal., Expert Deposition of Paul Wong, Ph.D., June 7, 2019.
2018	*State of Washington v. Franciscan Health System, et al.*, W.D. Wash., Declaration of Dr. Paul Wong In Support of Defendant Franciscan's Motion to Compel Production of Documents by First Choice Health Network, Inc., March 19, 2018.
2017	*State of Washington v. Franciscan Health System, et al.*, W.D. Wash., Declaration of Dr. Paul Wong In Support of Certain Defendants' Motion to Postpone Briefing on Plaintiff's Motion for Partial Summary Judgment, December 15, 2017.
2016	*In the Matter of: The Proposed Acquisition of Control of Health Net Life Insurance Company and Health Net, Inc. by Centene Corporation and Chopin Merger Sub I, Inc. and Chopin Merger Sub II, Inc.*, CA Department of Insurance, Written Testimony of Dr. Lawrence Wu and Dr. Paul Wong, File No. App-2015-00889, January 15, 2016.

Expert Engagements

2019	*Indiana Hospitals Do Not Have a "Monopoly Problem"*: Independent report commissioned by the Indiana Hospital Association analyzing hospital concentration and competition in Indiana.
2018	*Mat-Su Valley Medical Center, LLC v. State of Alaska*: Analysis of outpatient health care markets related to an ambulatory surgery center's Certificate of Need in Wasilla, AK.

Exhibit 1

Consulting Engagements

21st Century Oncology, Inc. v. The Honorable Ashley B. Moody, in her official capacity as the Attorney General of the State of Florida, and the Honorable Laurel M. Lee, in her official capacity as Secretary of the Florida Department of State: Challenge of Florida Statute 542.336 invalidating restrictive covenants (e.g., non-compete agreements) in physician contracts, alleging the statute was unconstitutional.

3B Medical, Inc. v. ResMed Corp.: Alleged foreclosure of the market for sleep apnea durable medical equipment due to a tying scheme involving sleep apnea ventilator machines and other related equipment.

Adventist Health System – Bert Fish Medical Center: Merger of hospitals in New Smyrna Beach, FL.

Adventist Health – Beverly Hospital: Acquisition of a failing hospital and investigation by the California Attorney General's office.

Advocate Health – NorthShore University Healthsystem: FTC challenge and merger litigation involving two hospital systems in Chicago, IL.

Aetna, Inc. – Humana, Inc.: Proposed merger of two health insurers. Investigation (initial and second request phases), DOJ challenge, and merger litigation of two nationwide health insurers.

Ascension Health – Wheaton Franciscan Healthcare: Merger of two hospital systems in Milwaukee, WI.

Aspirus Health Care – Ascension Health: Merger of seventeen hospitals in northern Wisconsin and Michigan.

Centene Corporation – Health Net, Inc.: Merger of two large health insurers with national but complementary footprints (see written testimony).

CHI Franciscan – Virginia Mason: Merger of hospitals and physicians in Washington state.

CHRISTUS – Trinity Mother Frances: Merger of hospitals and physicians in Tyler, TX.

CHRISTUS – Good Shepherd: Merger of hospitals and physicians in Longview, TX.

DiCesare, et al. v. Carolinas Healthcare System: A class-action litigation mirroring allegations in *United States of America and the State of North Carolina v. Carolinas Healthcare System* (see below).

Exhibit 1

FTC v. Surescripts, LLC: Allegations that Surescripts' loyalty discounts foreclosed competitors and inhibited competition in the two-sided electronic prescribing markets for routing and eligibility in violation of Section 2 of the Sherman Act.

Hackensack University Health Network – Meridian Health: Merger of two large hospital systems in NJ.

Hill Physicians – Muir Medical Group IPA: Affiliation of two independent practice associations involving nearly 5,000 physicians.

Hurst International v. Sinclair Systems International: Alleged predatory pricing by a large fruit labeling equipment and supply manufacturer and distributor.

Jefferson Health – Einstein Healthcare Network: FTC challenge and merger litigation involving two hospital systems in Philadelphia, PA.

Labcorp – Ascension Health: Acquisition of hospital-based laboratories across ten states by a national lab services provider.

Lafayette General Health – Regional Medical Center of Acadiana (an HCA hospital): Merger of hospitals in Lafayette, LA.

Marshfield Clinic Health System – Ascension Health: Merger of hospitals in Wausau, WI.

Memorial Hospital at Gulfport – Merit Health Biloxi (part of Community Health Systems): joint venture between two hospital systems in Biloxi, MS.

MultiCare – Capital Medical Center: Acquisition of a hospital by a health system in Olympia, WA.

NRT v. Everi (f.k.a., Global Cash Access): Alleged patent fraud, monopolization, and foreclosure of the market for in-casino cash access kiosks.

OMNI Healthcare, Inc., et al. v. Health First , Inc., et al.: Alleged monopolization and tying by a vertically integrated health system (insurance, hospitals, physicians) in an effort to foreclose the market for physician services.

Oregon Potato Company – NORPAC: Merger of two frozen vegetable processors in Western Oregon, one of which was a failing firm. Investigation of buyer (monopsony) and seller (monopoly) concerns by the DOJ.

PeaceHealth – Pacific Rim Outpatient Surgery Center: Acquisition of ambulatory surgery center by a hospital system.

Providence Health & Services – St. Joseph Health: Merger of two hospital systems, creating one of the ten largest nonprofit hospital systems in the U.S.

Exhibit 1

Providence Saint Joseph Health – Adventist Health: Merger of eight hospitals in Northern California.

Sanford Health – UnityPoint Health: Merger of two large hospitals systems spanning seven states.

Schuylkill Health System, et al. v. Cardinal Health, LLC and Owens & Minor Distribution, Inc.: Alleged overpayment as a result of a foreclosure scheme in markets for the distribution of hospital supplies, including suture and endo products.

Sonic Healthcare USA – ProPath: Merger of two clinical and pathology laboratories.

St. Agnes Medical Center (a Trinity Health hospital) – Madera Community Hospital: Acquisition of a failing hospital and investigation by the California Attorney General's office.

State of Washington v. Franciscan Health System, et al.: Challenge of Franciscan's acquisition of two physician groups in Kitsap, WA (The Doctors Clinic and WestSound Orthapaedics), alleging the acquisitions were unlawful under Section 1 of the Sherman Act and Section 7 of the Clayton Act.

SUNY Upstate Medical University – Crouse Hospital: Hospital merger, Certificate of Public Advantage (COPA) application, and investigation by the New York Department of Health.

The Wonderful Company v. Anthem Blue Cross and Lucile Packard Children's Hospital: Alleged monopolization by a nationally-renowned children's hospital and alleged conspiracy by the children's hospital and a large insurer.

UnitedHealth Group/Optum – DaVita Medical Group: National merger of United (a diversified healthcare company with insurance and physicians) and DaVita (physicians). Review of vertical merger issues (insurance-to-physician) in Colorado Springs, CO, and vertical and horizontal issues (insurance-to-physician and physician-to-physician) in Las Vegas, NV.

United States of America and the State of North Carolina v. Carolinas Healthcare System: Allegations that CHS's commercial insurance contracts prohibited innovation in insurance products and limited hospital competition in Charlotte, NC in violation of Section 1 of the Sherman Act.

Universal Hospital Services, Inc. v. Hill-Rom Holdings, Inc.: Alleged foreclosure in markets involving rental hospital equipment (specialty beds and other durable equipment) due to a tying scheme combining equipment rentals and the purchase of hospital beds.

Exhibit 1

University of Wisconsin Health/Unity-Gundersen Health Insurance – UnityPoint-Meriter/Physicians Plus Insurance Corporation: Merger of two vertically integrated health systems (insurance, hospitals, physicians) in Madison, WI, involving the simultaneous merger of provider-owned health plans, multispecialty physician groups, and hospitals.

Wilson N. Jones Memorial Hospital v. Texas Health Resources and LHP Hospital Group, Inc.: Market analysis in litigation concerning an alleged breach of contract.

Publications

2020 "Non-Compete Agreements: Might They Be Procompetitive in Healthcare?" *Antitrust Chronicle*, Competition Policy International (May 2020), with Yun Ling and Emily Walden.

2018 "Mini-Roundtable: Expert Witness in Competition Disputes," *Corporate Disputes Magazine*, (April-June 2018), with David Blackburn, Nathan Blalock, and Subramaniam Ramanarayanan.

"Uncertainty and Scientific Complexity: An Introduction to Economic Forces that Drive Current Debates in Health Care Antitrust," *Competition*, Antitrust and Unfair Competition Law Section of the State Bar of California, Vol. 27, Num. 1 (2018).

2017 "The Hypothetical Monopolist Test: Is There a 'Preferred' Method?" *Antitrust Health Care Chronicle,* American Bar Association Antitrust Section, Vol. 31, Num. 3 (2017), with Subramaniam Ramanarayanan.

"Health Care Antitrust: Are Courts Adapting to a Complex and Dynamic Industry or Are They Making Exceptions?" *Loyola University Chicago Law Journal*, Vol. 48, Num. 3 (2017), with Lawrence Wu.

"Features of Patient-Centered Primary Care and the Use of Ambulatory Care," *Population Health Management*, Vol. 20, Num. 4 (2017), with Ming Tai-Seale and Laura Panattoni.

Working Papers

"Entry and Long-Run Market Structure in Nongroup Health Insurance."

"Studying State-Level Variation in Nongroup Health Insurance Regulation: Insurers' Incentives to Screen Consumers."

"Competition and Innovation: Evidence from Patents and Field Trials for Genetically Modified Crops," with Petra Moser.

Exhibit 1

Invited Presentations

2022	"Implications for Merger Enforcement from Recent Federal Court Decisions Related to Healthcare and Technology," via Webinar, American Bar Association Section of Antitrust Law.
	"AHLA's Speaking of Health Law: Key Takeaways from Sidibe v. Sutter," via Webinar, American Health Lawyers Association.
2021	"Navigating Payer-Provider Contracts: Spotting the Antitrust Issues," via Webinar at Virtual Health Care Antitrust: Meeting the Challenge, American Health Lawyers Association.
	"#116 Can Non-Competes Be Procompetitive?: An Economist's View – Our Curious Amalgam," via Webinar, American Bar Association Section of Antitrust Law.
2020	"#93 Who Is Ready for 2021? Year in Review: Part 1 – Our Curious Amalgam," via Webinar, American Bar Association Section of Antitrust Law.
	"Winds of Change? Reactions to the Vertical Merger Guidelines and a Lookback at Prior Deals," via Webinar, American Bar Association Section of Antitrust Law.
	"Making a Comment: Perspectives on the ABA Comment to the Agencies' Draft Vertical Merger Guidelines," via Webinar, American Bar Association Section of Antitrust Law.
	"Antitrust Issues in Physician-Hospital Alignment," at the Physicians and Hospitals Law Institute, American Health Lawyers Association, Phoenix, AZ.
2019	"Steering Your Clients Right: Are Anti-Steering Contracts Permissible?" at the Antitrust & Trade Regulation Seminar, NERA Economic Consulting, San Diego, CA.
2018	"Ch-Ch-Changes: Analyzing Vertical Arrangements Reshaping Healthcare," at the Antitrust & Trade Regulation Seminar, NERA Economic Consulting, Bachelor Gulch, CO.
	"Cutting Edge Economic Issues: Real World Application – Two-Stage Bargaining Models, Vertical Integration, and Cross-Market Merger Effects," at the American Bar Association and American Health Lawyers Association Antitrust in Health Care Conference, Pentagon City, VA.
2017	"Too Big to Pass? Lessons from the Health Insurance Mega-Merger Challenges," at the Antitrust & Trade Regulation Seminar, NERA Economic Consulting, San Diego, CA.

Exhibit 1

2016	"Cross-Market Mergers in the Healthcare Industry: The New Focus of Antitrust Scrutiny," via Webinar, The Knowledge Group.
	"Developments in Hospital Merger Analysis: Competitive Effects Analysis in the Advocate-NorthShore Case," at the Antitrust & Trade Regulation Seminar, NERA Economic Consulting, Park City, UT.
2015	"Defining Healthcare Markets," at Sheppard, Mullin, Richter & Hampton LLP, Los Angeles, CA.
	"Entry and Long-Run Market Structure in Nongroup Health Insurance," at the U.S. Department of Justice, Washington, DC.
	"Entry and Long-Run Market Structure in Nongroup Health Insurance," at the U.S. Congressional Budget Office, Washington, DC.
	"Entry and Long-Run Market Structure in Nongroup Health Insurance," at Seattle University, Department of Economics, Seattle, WA.
2014	"Associations Between Features of Patient-Centered Primary Care and Patients' Use of Ambulatory Care," at the American Society of Health Economists, Biennial Conference, Los Angeles, CA.

Honors and Recognition

2011	Amos Warner Research Associate, Stanford University
2010	Stanford University Economics Fellowship, Stanford University
2008	Phi Beta Kappa, Eta Chapter of California, UCLA
	National Society of Collegiate Scholars, UCLA
	ALD/PES Honor Society, UCLA
	Professor Harry Simons Economics Scholarship, UCLA
2007	Howard J. and Mitzi W. Green Economics Scholarship, UCLA

Professional Service

2021-pres.	Healthcare and Pharmaceuticals Committee, Antitrust Section, American Bar Association
2018-2021	Mergers and Acquisitions Committee, Antitrust Section, American Bar Association

Exhibit 2
Materials Relied Upon

Bates Numbered Documents

BAH000000041-052
BAH000004613
BAH000010171
BAH000050845
BAH000078325-44
BAH000088575
BAH000101787
BAH000250282-7
BAH000257075
BAH000250792-8
BAH000257273
BAH000291961-2
BAH000291964-6
TEVRA-00123093
TEVRA-00162830-2
TEVRA-00336560-1
TEVRA-00345262
TEVRA-00498008-11
TEVRA-00577243-4

Depositions and Associated Exhibits

Craig Reinert (Bayer) Dep. Tr. 2/28/2023

Jeremy Page (Bayer) Dep. Tr. 12/7/2022

Reports

Expert Report of Mr. Andrew D. Richmond, September 7, 2023

Expert Report of Dr. Celeste C. Saravia, September 7, 2023

Expert Report of Dr. Paul Wong, August 9, 2023

Journals and Papers

Angrist, Joshua D. and Krueger, Alan B., "Does Compulsory School Attendance Affect Schooling and Earnings?," *The Quarterly Journal of Economics*, Vol. 106, No. 4, 1991

Angrist, Joshua D., "Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records," *American Economic Review*, Vol. 80, No. 3, 1990

Bairoliya, Neha, Karaca-Mandic, Pinar, McCullough, Jeffrey S., and Petrin, Amil, "Consumer Learning and the Entry of Generic Pharmaceuticals," *NBER Working Paper Series*, No. 23662, 2017

Black, Sandra E., "Do Better Schools Matter? Parental Valuation of Elementary Education," *The Quarterly Journal of Economics*, Vol. 114, No. 2, 1999

Card, David, "Using Regional Variation in Wages to Measure the Effects of the Federal Minimum Wage," *Industrial and Labor Relations Review*, No. 46, Vol. 1, 1992

Coate, Malcolm B., "The Use of Natural Experiments in Merger Analysis," *Journal of Antitrust Enforcement*, Vol. 1, No. 2, 2013

Coate, Malcolm B., and Fischer, Jeffrey H., "A Practical Guide to the Hypothetical Monopolist Test for Market Definition," *Journal of Competition Law & Economics*, Vol. 4, No. 4, 2008

Exhibit 2
Materials Relied Upon

Dafny, Leemore, Ody, Christopher, and Schmitt, Matt, "When Discounts Raise Costs: The Effect of Copay Coupons on Generic Utilization," *American Economic Journal: Economic Policy*, Vol. 9, No. 2, 2017

Duggan, Mark, and Scott Morton, Fiona, "The Effect of Medicare Part D on Pharmaceutical Prices and Utilization," *American Economic Review*, Vol. 100, No.1, 2010

Ellison, Glenn, and Fisher Ellison, Sara, "Strategic Entry Deterrence and the Behavior of Pharmaceutical Incumbents Prior to Patent Expiration," *American Economic Journal: Microeconomics*, Vol. 3, No. 1, 2011

Ellyson, Alice M., and Basu, Anirban, "The New Prescription Drug Paradox: Pipeline Pressure and Rising Prices," *NBER Working Paper Series*, No. 24387, 2018

Frank, Richard G. and Salkever, David S., "Generic Entry and the Pricing of Pharmaceuticals," *Journal of Economics & Management Strategy*, Vol. 6, No. 1, 1997

Grabowski, Henry G. and Vernon, John M., "Brand Loyalty, Entry, and Price Competition in Pharmaceuticals after the 1984 Drug Act," *Journal of Law and Economics*, Vol. 35, No. 2, 1992

Havnes, Tarjei, and Mogstad, Magne, "No Child Left Behind: Subsidized Child Care and Children's Long-Run Outcomes," *American Economic Journal: Economic Policy*, Vol. 3, No. 2, 2011

Hollis, Aidan, "The importance of being first: evidence from Canadian generic pharmaceuticals," *Health Economics*, Vol. 11, No. 8, 2002

Kangasharju, Aki, "Do Wage Subsidies Increase Employment in Subsidized Firms?," *Economica*, Vol. 74, No. 293, 2007

Kaufmann, Cornel, Schmid, Christian, and Boes, Stefan, "Health Insurance Subsidies and Deductible Choice: Evidence from Regional Variation in Subsidy Schemes," *Journal of Health Economics*, Vol. 55, 2017

Lechner, Michael, "The Estimation of Causal Effects by Difference-in-Difference Methods," *Foundations and Trends in Econometrics*, 2011, Vol. 4, No. 3, 2011

Madrian, Brigitte C., "Employment-Based Health Insurance and Job Mobility: Is There Evidence of Job-Lock?" *The Quarterly Journal of Economics*, Vol. 109, No. 1, 1994

Meurer, Michael J., "Allocating Patent Litigation Risk Across the Supply Chain," *Boston University School of Law, Law and Economics Research Paper Series*, 2018

Price, Joseph, and Wolfers, Justin, "Racial Discrimination among NBA Referees," *The Quarterly Journal of Economics*, Vol. 125, No. 4, 2010

Reiffen, David and Ward, Michael R., "Generic Drug Industry Dynamics," *The Review of Economics and Statistics*, Vol. 87, No. 1, 2005

Tenn, Steven, and Wendling, Brett W., "Entry Threats and Pricing in the Generic Drug Industry," *Review of Economics and Statistics*, Vol. 96, No. 2, 2014

Legal

Order Denying Defendant's 12(b)(6) Motion To Dismiss Second Amended Complaint filed January 6, 2022

Joint 30(B)(6) Stipulation, *Tevra Brands, LLC, v. Bayer Healthcare LLC,* No. 3:19-cv-04312-BLF, Exhibits A and B

Second Amended Complaint, *Tevra Brands, LLC, v. Bayer Healthcare LLC, and Bayer Animal Health GmbH*, No. 3:19-cv-04312-BLF, filed March 29, 2021

Press Releases

Exhibit 2
Materials Relied Upon

"Animal Supply Co. Acquired Zeus & Co. West." 12/20/2012, https://www.petbusiness.com/archives/animal-supply-co-acquires-zeus-co-west/article_b056a802-41a8-5fde-b1b6-081e667efcf5 html (accessed 9/27/2023).

"FidoPharm launches fipronil-permethrin combination product," 4/17/2013, https://www.dvm360.com/view/fidopharm-launches-fipronil-permethrin-combination-product (accessed 9/26/2023)

"Perrigo Company To Acquire Assets Of Sergeant's Pet Care Products, Inc., For $285 Million," 9/13/2012, https://investor.perrigo.com/2012-09-13-Perrigo-Company-To-Acquire-Assets-Of-Sergeants-Pet-Care-Products-Inc.-For-285-Million (accessed 9/26/2023)

"PetIQ, Inc. Enters Into Definitive Agreement to Acquire Perrigo Animal Health," 5/8/2019, https://www.globenewswire.com/news-release/2019/05/08/1819728/0/en/PetIQ-Inc-Enters-Into-Definitive-Agreement-to-Acquire-Perrigo-Animal-Health.html (accessed 9/26/2023)

"Phillips Acquires Gardner Distributing Co.", 8/8/2014, https://www.petbusiness.com/archives/phillips-acquires-gardner-distributing-co/article_1add029e-df72-5956-a8be-dac64639bbce html (accessed 9/27/2023)

"Phillips Acquires PFX Pet Supply, Pet Food Limited," 5/7/2013, https://www.petbusiness.com/archives/phillips-acquires-pfx-pet-supply-pet-food-limited/article_5d1f75b5-d19f-50f7-a24d-ccaf24f767d9 html (accessed 9/27/2023)

Publications

Abadie, A., "Difference-in-Difference Estimators," in *The New Palgrave Dictionary of Economics*, Palgrave Macmillan, 2008

Baye, Michael R., and Kovenock, Dan, "Bertrand Competition," *The New Palgrave Dictionary of Economics*, 2nd ed., Palgrave Macmillan, 2008

National Research Council, *Reference Manual on Scientific Evidence*, 3rd Edition, The National Academies Press, 2011

Pindyck, R. S. and Rubinfeld, D. L., *Microeconomics*, 9th ed., Upper Saddle River, N.J.: Pearson/Prentice Hall, 2017

Tirole, J., *The Theory of Industrial Organization*, 2nd ed., The MIT Press, 1988

United States Department of Justice and The Federal Trade Commission, "Horizontal Merger Guidelines," August 19, 2010, https://www.justice.gov/atr/horizontal-merger-guidelines-08192010 (accessed 9/27/2023)

Websites

https://www.amazon.com/s?k=advantix&rh=n%3A2975384011&ref=nb_sb_noss (accessed 9/26/2023)

https://www.chewy.com/brands/k9-advantix-ii-6500?nav-submit-button=&ref query=advantix&ref=searchRedirect (accessed 9/26/2023)

https://www.chewy.com/b/flea-tick-381 (accessed 9/26/2023)

Data

Bayer Animal Health, January 2011-February 2020

BAH000113460

Bayer Animal Health, P&L Statements, January 2014-July 2020

BAH000294430 BAH000294431 BAH000294432

Exhibit 2
Materials Relied Upon

BAH000294433	BAH000294458	BAH000294483
BAH000294434	BAH000294459	BAH000294484
BAH000294435	BAH000294460	BAH000294485
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BAH000294437	BAH000294462	BAH000294487
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BAH000294456	BAH000294481	
BAH000294457	BAH000294482	

Bayer Animal Health, Wholesale Transaction Data, January 2011-August 2020

BAHDATA0001.csv	BAHDATA0007.csv
BAHDATA0002.csv	BAHDATA0016 - HIGHLY CONFIDENTIAL.xlsx
BAHDATA0003.csv	BAHDATA0021 - HIGHLY CONFIDENTIAL.csv
BAHDATA0004.csv	BAHDATA0022 - HIGHLY CONFIDENTIAL.csv
BAHDATA0005.csv	BAHDATA0023 - HIGHLY CONFIDENTIAL.csv
BAHDATA0006.csv	BAHDATA0024 - HIGHLY CONFIDENTIAL.csv

Boehringer Ingelheim, Wholesale Transaction Data, January 2009-August 2020

Exhibit 2
Materials Relied Upon

2009_Q1_HIGHLY_CONFIDENTIAL.xlsx
2009_Q2_HIGHLY_CONFIDENTIAL.xlsx
2009_Q3_HIGHLY_CONFIDENTIAL.xlsx
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2020_Q1_HIGHLY_CONFIDENTIAL.xlsx
2020_Q2_HIGHLY_CONFIDENTIAL.xlsx
2020_JUL_AUG_HIGHLY_CONFIDENTIAL.xlsx

Elanco, Retail Sales Data (Nielsen, Rakuten, Kynetec, and Vetstreet), January 2016-July 2019

PW-B0020180_Highly Confidential - Attorneys' Eyes Only-c.XLSX
PW-B0020181_Highly Confidential - Attorneys' Eyes Only-c.XLSX
PW-B0020182_Highly Confidential - Attorneys' Eyes Only-c.XLSX
PW-B0020183_Highly Confidential - Attorneys' Eyes Only-c.XLSX

Third-Party Sales Data

Current Data Flat File - Updated.xlsx

Tevra Brands, Imidacloprid Sales, January 2021-June 2023

Sales by Product Summary Report 2021-c.xlsx

Exhibit 2
Materials Relied Upon

Sales by Product Summary Report 2022-c.xlsx

Sales by Product Summary Report Jan-Jun 2023-c.xlsx

Tevra Brands, Sales Forecasts, 2017-2019

Imid-Fip Sales Recap-c.xlsx

Tevra Brands, P&L Statements, January 2015-May 2023

Tevra+Brands_Profit+and+Loss all years-c.xlsx

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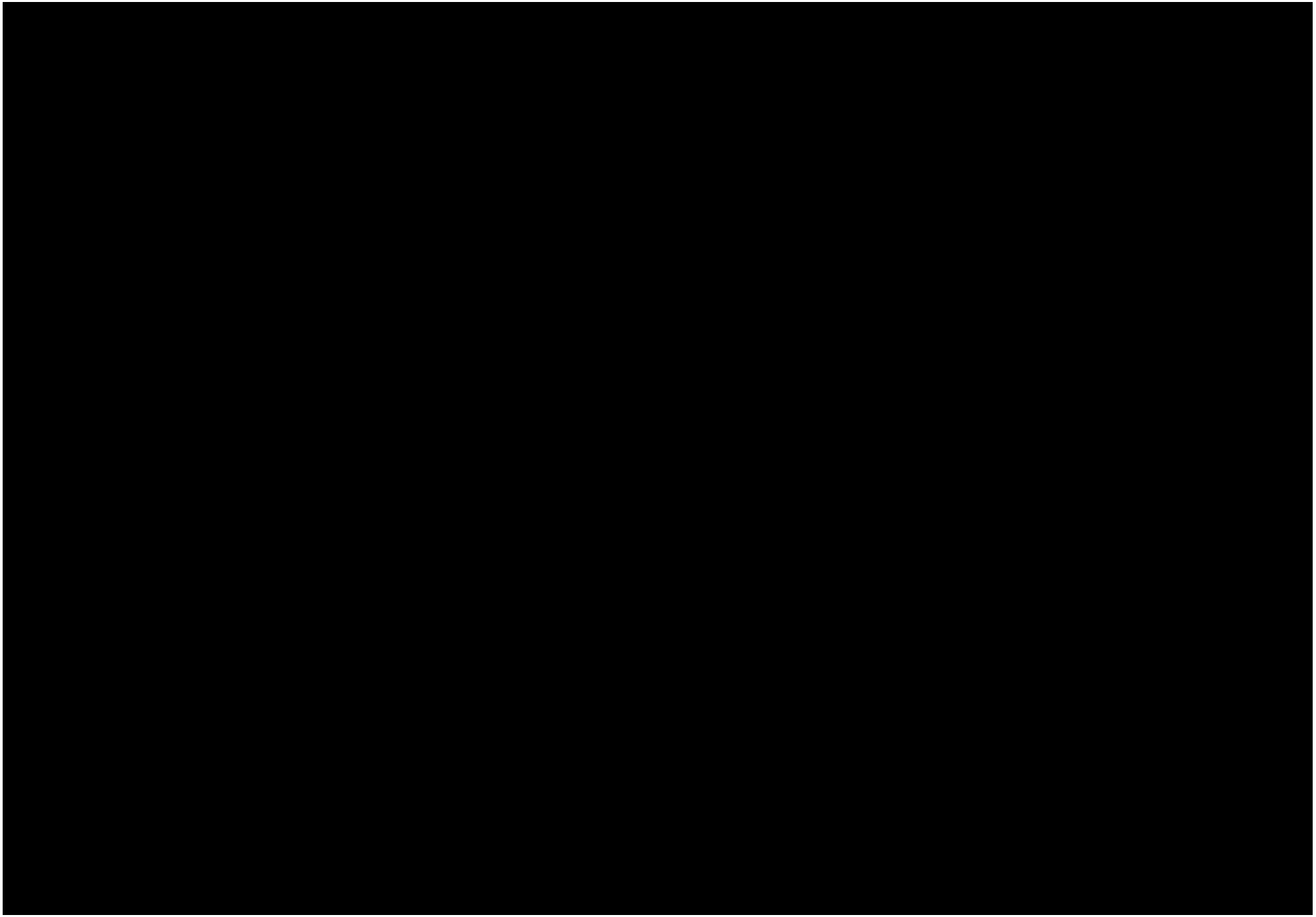

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